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THE MEASUREMENTS OF HANDWRITING.

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1. INTRODUCTION.

A scale for measuring the quality of handwriting would be an exceedingly useful tool for testing the efficiency of pupils in writing. It would also be a valuable instrument for the scientific investigation of the methods and factors in the learning and teaching of writing.

The pioneer contribution in this field was made by Thorndike[1], who succeeded in preparing a scale for the grading of general merit of handwriting. This scale was constructed from one thousand samples of writing, furnished by fifth to eighth grade pupils. These samples were arranged in the order of merit by forty or more competent judges. This resulted in a scale of graded specimens ranging in quality from zero to eighteen, zero being absolutely illegible and eighteen being a perfect copper plate sample. The differences between the

[1]THORNDIKE, E. L. *Handwriting.* Teachers College Record, Vol. II, No. 2, March, 1910.

successive steps of the scale are equal in amount. Thus quality five is as much better than quality four as quality twelve is better than quality eleven. A given specimen of writing is measured by putting it alongside the scale and determining to what quality it is nearest.

The scale itself has a high degree of accuracy; but in practical use two difficulties of minor importance are met. One is that, although the scale is constructed on the basis of general merit or quality, it in reality measures primarily the form or aesthetic appearance of writing. Even if one tries to avoid estimating beauty, legibility or individuality, and tries to estimate only the general merit, the chief basis of grading is still form or appearance. This criticism, however, is of little significance since form and general merit are quite closely correlated.

Another difficulty which has been urged by the critics of this and other scales is that the measurements made thereby are subject to considerable error. One individual may judge a given specimen of writing as number nine; another may judge it as number twelve. This error can be partly overcome by practice, and, as I shall point out later, is very much less than the error in the usual marking of penmanship by the teacher.

The second scale for handwriting was prepared by Ayres[2] and is a scale of legibility only. It was constructed by measuring the speed of reading 1578 samples of children's writing. The words in these samples were thrown out of their natural context. These specimens were then read by ten different persons, and an average reading time was computed for each sample, and from the entire group typical specimens were selected which represent eight equally distant degrees of legibility. The scale consists of three samples, slant, medium, and vertical, for each of the eight degrees of legibility. Measurements are made in the same manner as with the Thorndike scale.

The Ayres scale has several shortcomings. First, it does not contain enough steps, particularly at the lower end. The lowest quality in the scale is better than the majority of the writing of first and second grade pupils. Second, while the scale

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[2]AYRES, L. P. *A Scale for Measuring the Quality of Handwriting of School Children.* Russell Sage Foundation, New York City.

itself is constructed on the basis of legibility it measures not legibility but rather the form or appearance of the sample. This is a more serious difficulty in the Ayres scale than in the Thorndike scale. For, the probability is that appearance is more closely related to general merit than to legibility. Third, the question must be raised whether measuring the legibility of isolated words, as was done in the preparation of the Ayres scale, is identical with measuring the legibility of words in their context. I believe they are very closely related, as I shall show in a later paragraph, but the question is a legitimate one and must be cleared up.

2. Analysis of the Essential Elements of Handwriting.

Both the Thorndike and the Ayres scales measure a single feature or a composite group of features. But in order to make a complete measurement of any sample of writing it is necessary to measure all of its essential characteristics. Handwriting is not an end in itself. It is purely an agency of communication and must therefore be measured or evaluated in terms of utility.

A simple analysis of handwriting shows that its three chief elements are legibility, producibility, and form. The first two are the utilitarian qualities, the third is the aesthetic quality. Perhaps the most important characteristic is legibility. Writing is for the purpose of reading. That writing which can be read most easily is adjudged the best. A means of measuring legibility is therefore absolutely necessary. Of almost equal importance are the ease and speed of producing the writing. The form or beauty of writing is of secondary importance although form and legibility are fairly closely correlated especially among the poorer qualities of writing.

Other characteristics such as individuality, size, style, slant, etc., are of little or no consideration from the standpoint of the prime function of handwriting except in so far as they are factors in legibility, or in producibility, or in beauty.

3. Methods of Measurements.

How may these essential characteristics be measured?

1. *Legibility.* The only attempt made thus far to measure legibility is by means of the Ayres scale. As pointed out

above, the scale itself is, no doubt, constructed accurately on the basis of legibility, but in actually rating a sample of writing with it you adjudge its form rather than its legibility.

The most obvious means of measuring legibility would be to determine the time required to read a given specimen as quickly as possible and then to compute the time per letter or per word. But this method would have the objection that it could not be used when the context of the material is familiar, nor could the measurements be repeated except after long intervals of time when the context had been forgotten. It could therefore not be used to test the legibility of the writing of a class of pupils all of whom wrote the same material.

I wish now to present some experimental data to illustrate a simple and fairly accurate means of measuring legibility by measuring the speed of reading letters. The apparatus consisted simply of a stopwatch and a circular piece of stiff cardboard, 20 cm in diameter, into which three round openings, 2.5 cm in diameter, had been punched. These apertures were made in a straight row, 1.5 cm apart, the middle one being at the center of the card. This particular size of card was chosen so as to cover practically all the writing of a given sample except that which would be shown in the openings. A circular card is better than a rectangular one because it can be placed more conveniently in any position so that the three openings can have any chance location on the sample of writing. Apertures of 2.5 cm are large enough to expose several letters and yet not so large as to expose entire words or groups of words.

The legibility of a sample of writing would be tested by placing the card in any position upon the sample and by reading as quickly as possible all the letters exposed in the openings. The time of reading and the number of letters exposed are then recorded. The card is placed in another position and the number of letters and the reading time are again recorded. Sometimes a third reading is taken. From these determinations the reading time per letter is computed. If the sample of writing is composed of repeated lines written one under the other the card should not be placed so that the openings are in a vertical row. Care must also be taken that one does not see what letters are exposed until one begins to take the reading time.

This method of measuring legibility has certain advantages. It is simple, quick, and fairly accurate. It can be repeated with the same sample as often as is desired without any disturbing effect of familiarity, and it measures what you really wish to measure, namely, legibility. It is also possible for persons of different speeds of reading to reduce their tests to a common scale by using certain common specimens.

The chief consideration regarding the validity of this method is whether the legibility of letters is the same or sufficiently closely related to the legibility of words and sentences in sensible context to afford a reliable measure. To answer this question I made the following tests. Ten different specimens of widely varying degrees of legibility were chosen from personal letters. The length of the specimens ranged between 100 and 300 letters. Each sample was read as quickly as possible and the time registered with a stopwatch. From this the time per letter was computed. Likewise each sample was measured by the above described letter-exposure method. Three separated determinations were made by both methods at intervals of approximately two weeks. The results are given in Table I.

TABLE I.

	Legibility of words in context.		Legibility of letters.	
Samples	Av.	M.v.	Av.	M.v.
1	.076	.007	.28	.02
2	.102	.005	.31	.02
3	.110	.015	.41	.04
4	.107	.006	.40	.01
5	.091	.004	.33	.03
6	.065	.005	.25	.02
7	.070	.009	.28	.01
8	.096	.003	.35	.02
9	.101	.003	.35	.02
10	.118	.013	.40	.01
Av.		.007		.02

The figures in the table give the reading-times per letter expressed in fractional parts of a second. The table shows that the legibility of letters is practically identical in relative order with the legibility of words in their context. The coefficient of correlation of the two series of measurements is +.90. The degree of reliability of the measurements themselves is high as indicated by the small mean variations, .007 and .02 on the average.

Another set of tests to demonstrate the relation of legibility of words to legibility of letters was made with the samples in the Ayres scale. As previously stated the Ayres scale is composed of specimens of uniformly increasing degrees of the legibility or words thrown out of their natural context. Each sample was measured at two different times by the letter-exposure method giving the following results:

TABLE II.

	Legibility of Letters.	
Ayres Scale.	Av.	M. v.
20	.36	.03
30	.32	.03
40	.297	.02
50	.303	.01
60	.28	.02
70	.27	.03
80	.267	.02
90	.267	.01
Av.		.02

The second column gives the averages of the measurements of the samples under each quality in the Ayres scale. The coefficient of correlation between the legibility of letters and the legibility of words is .97. The average of the mean variations is again .02.

These two tables demonstrate that the measurements themselves are accurate as is indicated by the small mean variations and that the proposed manner of measuring legibility by the letter-exposure method is a fair index of the legibility of text in its natural order.

At this point it may also be of interest to show the relationship between legibility and general merit in handwriting as represented in Thorndike's scale. To this end I measured all the samples in the Thorndike scale by the letter-exposure method, yielding the results in Table III.

The coefficient of correlation between legibility and general merit is .74. In this computation the averages in the last column (Table III) are used. This yields a higher correlation than if the measurements of the individual samples are used. In the latter case the correlation is .63.

2. *Producibility.* Economy in the production of writing can be measured by measuring the speed and ease of writing.

TABLE III.

Quality.	Sample.	Average.	
18	125	.20	.20
17	141	.255	.255
16	32	.20	
	84	.26	.275
15	49	.21	
	89	.17	
	47	.24	
	90	.23	.21
14	54	.23	
	19	.23	.23
13	55	.22	
	24	.27	
	26	.24	
	4	.27	.25
12	30	.22	
	7	.24	
	52	.21	.22
11	23	.24	
	45	.31	
	106	.27	.27
10	17	.28	.28
9	31	.25	
	21	.23	
	28	.27	.25
8	14	.38	
	48	.29	.34
7	126	.46	.46
6	12	.51	.51
5	6	.56	.56
4	121	.80	.80

The simple measurement of speed itself is for all practical purposes a fairly reliable measure of producibility. Writing produced with laborious movements cannot be produced rapidly. The simplest method for measuring the speed of writing of a group of persons is to have them all write for a definite number of minutes and then to compute the number of words or preferably letters written per minute. The letter is a better unit than the word.

3. *Form or Beauty.* This characteristic, although of less practical importance, is more difficult to measure than either legibility or producibility. From the purely practical viewpoint, beauty of handwriting is of little consequence, nevertheless our artistic sense regards that handwriting better and more desirable which has the more pleasing appearance. And, as appeared from Table III, the more beautiful writing is, up to certain limits, the more legible and, to a less extent, the more easily written.

In the investigation to be discussed presently the Thorndike scale was used for measuring over two thousand samples. The Thorndike scale is, of course, constructed on the basis of general merit in handwriting, but the very nature of using the scale makes it primarily an instrument for evaluating the form or appearance of writing just as Ayres scales, although constructed on the basis of legibility, is in its practical use chiefly a measurement of form. At any rate it is the best available means for measuring form or aesthetic appearance.

The critics of scales have objected on the ground that measurements made with them are subject to error and uncertainty and that you might as well not use them at all. It is true that any measurement is subject to error. The ultimate test of validity would be to determine whether measurements of handwriting made by any one of these scales would be more accurate than the simple evaluations in terms of marks or percentages usually made by teachers.

A comparison of this kind was made in the following manner: Fifteen specimens of handwriting were obtained from pupils in the public schools of Madison. Two sets of judges, consisting of ten business men and ten teachers, graded these specimens in three different ways: (a) by the Thorndike scale, (b) by the Ayres scale, and (c) by the usual percentile method used in school. It was explained to the judges that 100% would represent perfect writing and zero would be absolutely illegible or unintelligible writing.

Ten business men were included among the judges in order to obtain estimates from the practical view point as well as from the view point of the school.

To make the gradings as fair as possible the order of the scales was varied for each judge. That is, one judge would grade all samples first by the Thorndike scale, second by the Ayres scale, and third by the percentile method. The next judge would grade first by the Ayres scale, second by the percentile method, and third by the Thorndike scale, etc. The specimens were also shuffled before proceeding from one scale to the next.

To illustrate the kind of results obtained we may notice the ratings of one sample made by the ten teachers according to

each of the three methods of measurements: By the Thorndike scale, 8, 9, 9, 8, 8, 10, 8, 8, 8, 7; by the Ayres scale 30, 30, 20, 30, 20, 50, 30, 30, 30, 30; by the percentile method 30, 35, 73, 50, 50, 70, 60, 68, 70, 25.

These measurements may seem to vary rather widely, particularly those obtained by the percentile method, but these variations are no greater than they would be in the case even of a mathematics paper, as has been shown by extensive tests.[3] Table IV. gives the results[4] in a comprehensive form.

The relative as well as the absolute accuracy of measurements made with the different scales is indicated by the mean variations. In order to make these mean variations comparable it is necessary to reduce them all to terms of the percentile method. This was done by multiplying each mean variation by a certain constant which expresses the relation between the scales. To illustrate how this constant was obtained it will be noticed that on the percentile scale 0 is understood to mean absolutely illegible writing and 100 means perfect copper plate writing. On the Thorndike scale 0 corresponds to 0 on the percentile scale and quality 18 corresponds to 100 on the percentile scale. Hence one step on the Thorndike scale is equivalent to 5.5 points in the percentile scale, and, therefore, the mean variations for the Thorndike scale would have to be multiplied by 5.5 to make them directly comparable with the mean variations for the percentile method. In case of the Ayres scale this constant is more difficult to determine because we do not know whether 100 would be perfect writing or whether 0 would be zero on quality. The relation, however, can be determined accurately from the measurements as follows: Specimen No. 4 is the best one of the fifteen and is ranked by the business men as 66, Ayres scale, or 71.5, percentile method. Specimen No. 15 is the poorest and is ranked as 22, Ayres scale, or 34, percentile scale. Hence the difference between 66 and 22, or 44, is equivalent to the difference between 71.5 and 34, or 37.5. Hence one point on the Ayres scale is equivalent to .85 points on the percentile scale. By

[3] See STARCH AND ELLIOTT, *Reliability of Grading Work in Mathematics*. School Review, April, 1913, p. 254-259.

[4] These measurements and computation were made with the assistance of Mr. W. C. Koepke, to whom much credit is due.

TABLE IV.

		Business Men.			Teachers.		
		T.	A.	%	T.	A.	%
1.	Av.	10.	43.	50.8	10.	53.	68.9
	M. V.	1.	6.8	10.1	1.	11.6	9.7
	M. V.*	5.5	5.8	10.1	5.5	9.1	9.7
2.	Av.	10.8	55.	60.	11.7	61.	76.1
	M. V.	.7	7.	11.	.7	5.4	9.3
	M. V.*	3.8	5.9	11.	3.8	4.2	9.3
3.	Av.	8.6	30.	40.5	8.3	30.	53.1
	M. V.	.6	4.	11.2	.6	4.	15.1
	M. V.*	3.3	3.4	11.2.	3.3	3.4	15.1
4.	Av.	12.4	66.	71.5	12.8	76.	83.3
	M. V.	1.04	8.8	7.8	1.1	8.	6.4
	M. V.*	5.8	7.5	7.8	5.9	6.3	6.4
5.	Av.	10.1	50.	59.6	10.1	54.	70.9
	M. V.	.9	8.	9.8	1.1	6.8	10.7
	M. V.*	5.	6.8	9.8	5.9	5.4	10.7
6.	Av.	11.6	58.	67.2	11.8	63.	78.
	M. V.	.7	10.	9.8	1.	7.6	8.4
	M. V.*	3.9	8.5	9.8	5.3	6.	8.4
7.	Av.	9.	40.	51.	10.	43.	66.2
	M. V.	.8	6.	10.	1.	7.	13.
	M. V.*	4.4.	5.1	10.	5.5	5.5	13.
8.	Av.	9.6	49.	56.	10.2	51.	72.2
	M. V.	.7	7.2	9.6	.8	7.4	10.2
	M. V.*	3.8.	6.1	9.6	4.4	5.8	10.2
9.	Av.	9.	35.	50.	9.1	44.	63.3
	M. V.	.6	10.	10.	.6	7.2	11.6
	M. V.*	3.3.	8.5	10.	3.5	5.7	11.6
10.	Av.	10.9	48.	60.5	11.8	70.	80.
	M. V.	.9	6.8	7.6	.8	6.	7.
	M. V.*	5.2	5.8	7.6	4.6	4.7	7.
11.	Av.	8.8	32.2	45.5	8.7	42.	58.4
	M. V.	.7	6.8	9.4	.7	12.	14.4
	M. V.*	3.8	5.8	9.4	3.8	9.5	14.4
12.	Av.	8.1	32.	42.8	8.4	34.	54.5
	M. V.	.5	8.8	11.7	.6	6.8	16.2
	M. V.*	3.	7.5	11.7	3.6	5.3	16.2
13.	Av.	8.8	38.	48.3	9.4	44.	64.9
	M. V.	.7	5.2	11.6	.8	5.6	7.5
	M. V.*	3.9	4.4	11.6	4.2	4.4	7.5
14.	Av.	9.7	48.	56.	9.6	47.	67.9
	M. V.	1.1	.8	7.3	.8	6.2	10.7
	M. V.*	6.1	6.8	7.3	4.4	4.9	10.7
15.	Av.	7.3	22.	34.	6.9	22.	41.1
	M. V.	.6	3.2	13.8	.4	3.2	17.9
	M. V.*	3.1	2.7	13.8	2.1	2.5	17.8

*Mean variation of Thorndike and Ayres scales in terms of the percentile scale.

T=Measurements with the Thorndike scale.

A=Measurements with the Ayres scale.

%=Measurements with the percentile method.

comparing the next highest with the next lowest sample, etc., an average constant was computed which in the case of the business men was .85 and in case of the teachers was .79.

It was also found that the 0 point and the 18 point on the Thorndike scale did not correspond exactly to the 0 and the 100 points on the percentile scale. By a comparison similar to the one made for the Ayres scale it was found that the constant should be 8.2 for the business men and 7.25 for the teachers, instead of 5.5. Thus the second mean variations given in the table are directly comparable since they are reduced to exactly the same terms.

The average mean variations for the fifteen samples are expressed in the following table. All are reduced to the terms of the percentile method.

Judges.	T. scale.	A. scale.	% scale.
Business men.....	6.32	6.04	10.04
Teachers.....	5.66	5.49	10.30

From these figures it can be seen that the measurements made by either one of the scales are approximately twice as accurate as those made without a scale. The gradings made by the teachers and the business men are almost identical in all essential respects. These results demonstrate beyond dispute the far greater accuracy of measurements by means of these scales. Furthermore we should also notice that the judges were not practiced in the use of the scales. Familiarity with the scales reduces the error to nearly one-half.

In support of this point it is interesting to note that the probable error of the ratings of three samples made by fifty-four persons was .9 of a step on the Thorndike scale, whereas the average deviation of my own ratings of these three samples from the average of the fifty-four was only .6. My own ratings were made after I had had the practice of rating over 2,000 samples.

We may thus conclude that after some practice in the use of a scale the measurements with either scale are from three to four times as accurate as the evaluations made by the usual percentile marking system.

4. Testing the Writing of a School System.

A sample of handwriting was obtained under specified laboratory conditions from every pupil in the first to the eighth grades in the schools of Madison, a total of 2190 samples. These specimens were obtained at the end of the school year, June, 1912, so that it would be possible thereby to establish definite standards of attainment in writing for each grade. For this purpose it was obviously better to produce the samples at the end rather than during the school year.

The specimens were obtained by the teachers according to the following typewritten directions which were placed into their hands.

Writing Test.

Give date, name, and grade at the top of the paper.

Each pupil is to write "Mary had a little lamb" repeatedly for two minutes.

To get an accurate record of the time the teacher should see that each pupil is ready with pen and ruled paper. At the signal from the teacher all should begin. They should write as well as they can, and without interruption at natural speed for two minutes, when the teacher will give the signal to stop.

All writing was done on regular foolscap in ink excepting in the first and in several second grades where the pupils had not yet begun to use pen and ink. The time limit of two minutes was chosen because it was short enough to avoid fatigue and long enough to give a sufficiently large sample for all purposes of measurement. In order to obtain a test of speed it was necessary to use something that could be written from memory. Either copying or dictating would interfere with the natural speed of writing. The line "Mary had a little lamb" was chosen because it would be familiar to even the youngest pupils.

I then measured the speed, legibility, and form of each sample, requiring altogether hours upon hours of close application. The speed is indicated in the tables as so many letters per minute. The form is measured in terms of the Thorndike scale by the ascending-descending procedure. That is, a group of thirty or forty samples was taken and each one was graded by beginning at the lower end of the scale and ascending until the quality was reached to which the sample was judged equal. After the entire group had been rated in this manner, each

sample was judged again by beginning at the upper end of the scale and descending until equivalence was established. The average of these two determinations was taken as the final measurement. It is believed that this method yields considerably more accurate results than a single comparison of the sample with the scale.

The legibility is indicated in terms of the reading time per letter as determined by the letter-exposure method. In order to avoid any effect of fatigue of the eyes upon the measurements, the legibility tests were never continued longer than an hour at a time.

Tables V, VI and VII give the combined results. The different schools are indicated by letters at the left. The grades are numbered across the top. The blank spaces in the tables are due to the erroneous performance of the test in those particular grades.

TABLE V.

Speed of Writing. Letters per Minute.

Schools.	Grades. 1	2	3	4	5	6	7	8
A	12.9	31.5	32.9	35.3	39.4	51.8	65.3	84.6
B	22.1	30.8	31.7	30.6	43.7	49.7	72.9	90.7
C	18.4	21.6	25.5	44.3	44.2	59.6	86.9	86.7
D	19.4	40.8		36.2	63.9	57.9	82.2	87.3
E	16.0	38.0	40.7	47.7	56.0	83.0	81.7	89.6
F	14.7	41.7	39.4	40.3	49.8	52.4	80.3	87.6
G	21.6				56.0	50.2		
H	15.1	25.4	33.8	41.7	42.3	90.2	88.9	79.6
I	25.4	33.5	34.9	31.1	55.8	64.4		
J	27.5	34.4	33.6	54.3	55.4	57.2	76.7	72.0
Average	19.3	33.1	34.0	40.2	50.6	61.6	79.4	84.8

Figure 1 represents the curves plotted from the averages of the three tables. They are drawn in such a way that the beginning and the end points of the three curves coincide. This makes it possible to compare directly the relative rates of improvement in the three elements of writing from grade to grade. The grades are given along the horizontal base-line and the scales to which the curves are drawn are indicated on the left side.

These curves bring out several interesting facts. In the first place it is quite evident that the improvement in the three factors is not simultaneous. There is relatively little improvement in speed in the first three years but after that it increases very rapidly up to the seventh grade. The eighth

TABLE VI.

Form of Appearance of Writing. Thorndike Scale.

Schools.	Grades. 1	2	3	4	5	6	7	8
A	6.9	7.2	7.8	8.4	9.1	9.2	9.3	9.3
B	6.4	7.6	8.1	8.5	8.7	9.5	9.4	10.1
C	6.3	7.8	7.9	8.2	9.1	9.6	9.8	9.9
D	5.4	7.1		8.8	9.3	10.8	10.5	11.6
E	6.1	7.3	6.3	8.6	9.9	10.0	10.1	11.2
F	5.6	7.1	7.9	8.9	9.4	10.2	10.0	9.8
G	5.6				8.0	10.7		
H	5.9	8.6	7.7	9.1	9.7	8.9	10.9	10.2
I	5.7	7.0	8.4	8.2	9.1	9.6		
J	6.5	7.3	8.1	8.8	10.0	9.9	10.2	11.0
Average	6.0	7.4	7.8	8.6	9.2	9.8	10.2	10.4

TABLE VII.

Legibility of Writing. Time per letter (seconds.)*

	Grades. 1	2	3	4	5	6	7	8
A	.52	.34	.28	.27	.29			.295
B	.45	.40	.30	.29				.28
C	.38	.32	.28	.29				.28
D	.56	.35		.29				.28
E	.53	.34	.37	.28				.28
F	.50	.35	.33	.30				.28
G	.60							
H	.56	.33	.326	.28				.29
I	.59	.37	.31	.30				
J	.45	.35	.29	.275	.27			.27
Average	.514	.35	.31	.286				.282

grade gains relatively little over the seventh. Improvement in form is more steady but it is somewhat more rapid at first and quite small in the last year. Improvement in legibility takes a very different course. It increases very rapidly in the first two years and then more gradually, reaching practically its height in the fourth year. After that there is almost no improvement in legibility. This is due largely to the fact that after the improvement in form has reached a certain stage, approximately quality ten or even less, there is no longer any gain in legibility. Specimens better in form than quality ten are about alike in legibility.

Figures 2, 3, and 4 show interesting sex differences. The girls are superior to the boys in each instance, particularly in form. The difference in speed is perhaps negligible. The superiority of the girls is perhaps due to their somewhat

*The legibility of grades five, six, and seven was not measured as there is no improvement after the fourth grade.

greater diligence and interest in aesthetic form and possibly also to their tendency toward earlier maturity.

Table VIII gives the correlations between the various elements of writing and between writing ability and scholarship. These coefficients were computed on the basis of the pupils of the third and seventh grades in schools C, F, and H, a total of 144 pupils.

TABLE VIII.

Writing and scholarship	.31
Speed and form	.10
Speed and legibility	.12
Form and legibility	.34

Writing is apparently not as closely correlated with other studies as the latter are correlated among themselves. The correlations among such studies as arithmetic, geography, etc., are between .70 and .85. There is practically no correlation between speed and form or speed and legibility. This was to be expected since increase in speed tends to reduce form and legibility. But a fast writer is apt to be a better writer than a slow writer when the former writes at the slow speed of the latter.

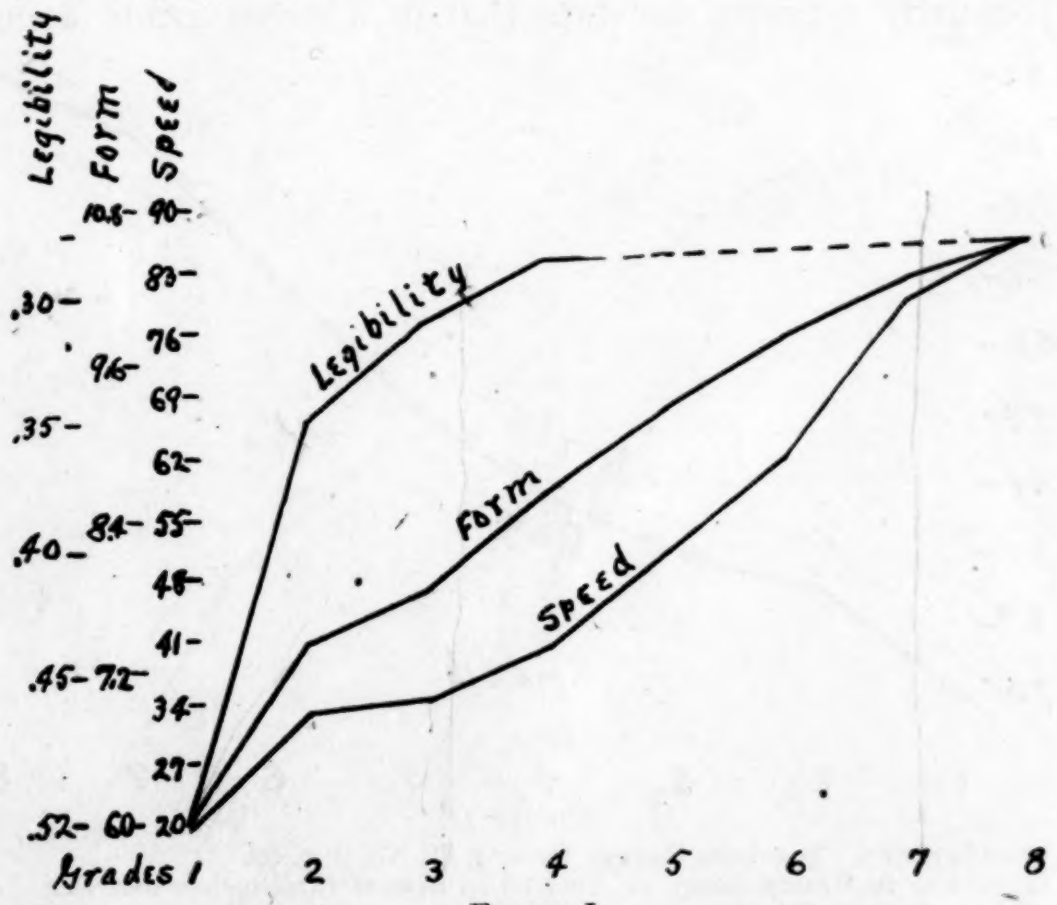

FIGURE I.

Thorndike[5] states that among adults the correlation between scholarship and handwriting is zero. Gesell's[6] study of children's writing shows about the same correlation as that in Table VIII. Both are probably correct. The little correlation that exists in case of the children is probably due to instruction and is largely lost in adults.

5. Standards of Attainment for Each Grade.

What is needed in every branch of instruction in the public schools is a definite standard of attainment or efficiency to be reached at the end of each grade. If we had such standards and if we had adequate means of precisely measuring efficiency it would be possible for a qualified person to go into a school room and measure the ability in any subject and state on the basis of his measurements whether the pupils are up to the standard, whether they are deficient, how much and in what specific respects. How this may be done with handwriting in an accurate way is the purpose of this section.

1. *How Obtain Standards?* We might set the standard of efficiency for a given grade in one of two ways. We might arbitrarily estimate or state that in a given grade a pupil

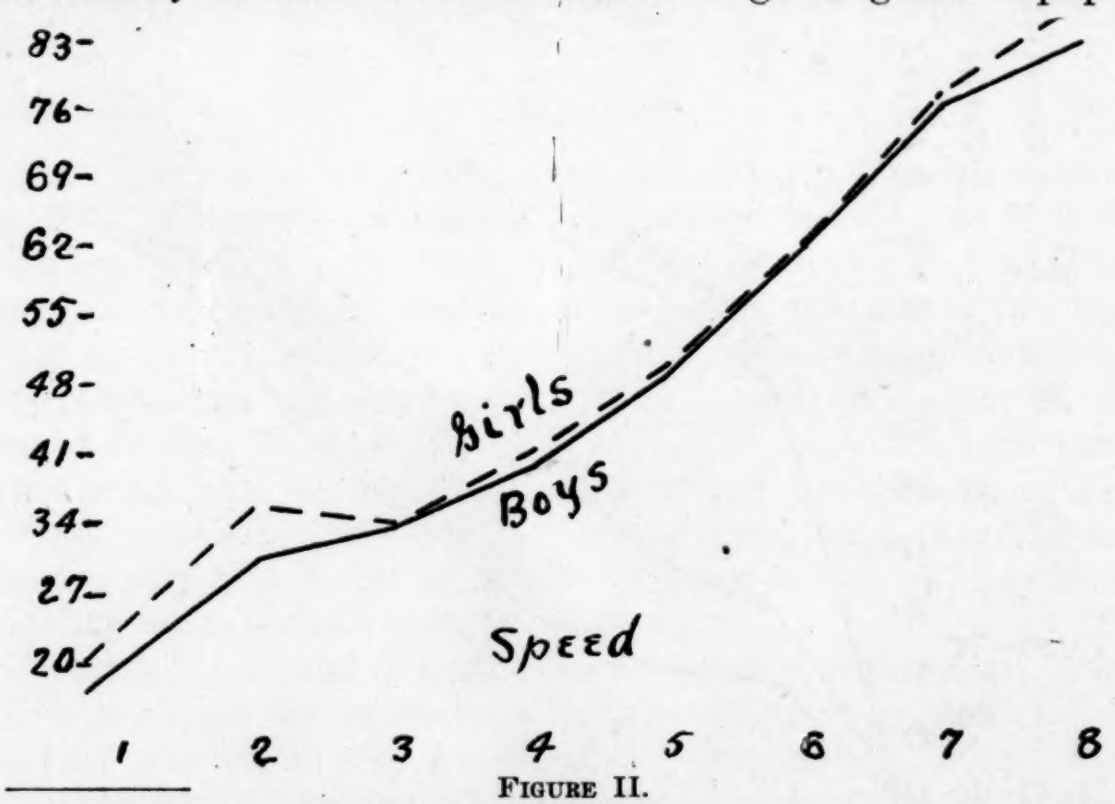

FIGURE II.

[5]*Handwriting.* Teachers College Record, II, No. 2, p. 39.

[6]*Accuracy in Handwriting, as Related to School Intelligence and Sex.* Am. J. of Psy., Vol. 17, 394-405.

should reach a certain speed, a certain degree of legibility and a certain standard of form. Or, we might find out what the average efficiency of a very large number of pupils at their best is in speed, legibility, and form, and take these averages as standards. The latter is the only feasible and just method and is the one used here for determining the standards of efficiency in handwriting in each grade. An arbitrary standard might be too high or too low. An empirical standard tells you what it is actually possible for the average pupil to achieve under favorable conditions.

The standards that will be used here are the ones obtained from the entire school system of Madison. As such they cannot be regarded as universal standards, for such could be determined only by combining the measurements of many different school systems. But probably the deviation of the Madison standards are not very marked from the composite standards that would be obtained from many places. For the present we may regard them as tentatively valid standards.

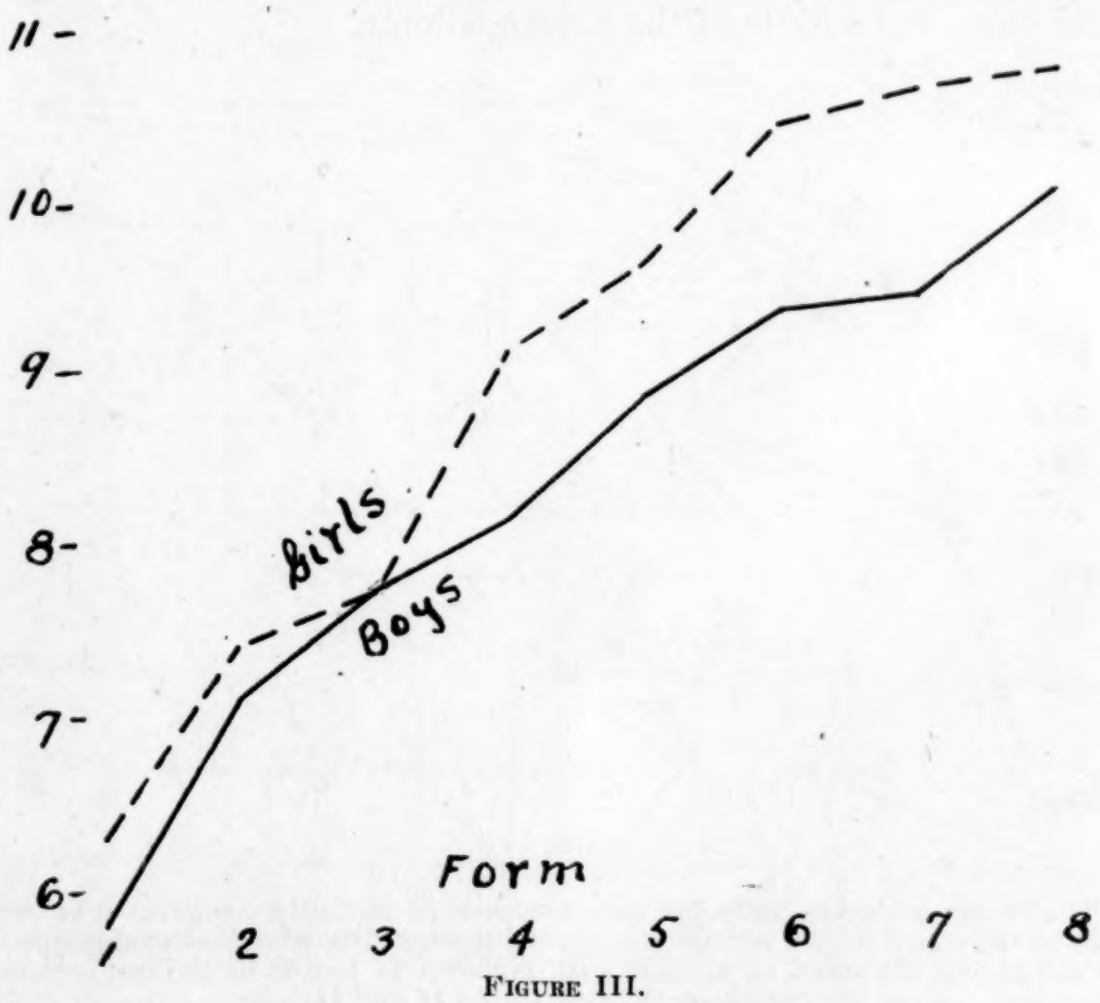

FIGURE III.

A composite set of standards can now easily be obtained as we have the tools of measurement at hand. A continuation of this work is now in progress.

2. *Method of Plotting Graphs.* The degree of efficiency of a given pupil, grade or school can be most simply represented by a series of graphs. Figure 5 shows a standard graph chart. The vertical columns represent the eight grades. The three horizontal lines are the scales for the three elements of writing: speed, legibility, and form. The division marks on each scale are so placed that the middle point of any column represents the average standard of attainment for that grade. These averages are taken from Tables V, VI, and VII. The numbers on the scale for speed are letters per minute, those on the scale for form are the numbers of the qualities in the Thorndike scale, and those on the scale for legibility are hundredths of a second which express the reading-times per letter.[7] Thus the graph of a pupil in the fourth grade who is exactly up to the standard in every respect would be a straight line down the middle of the fourth column.

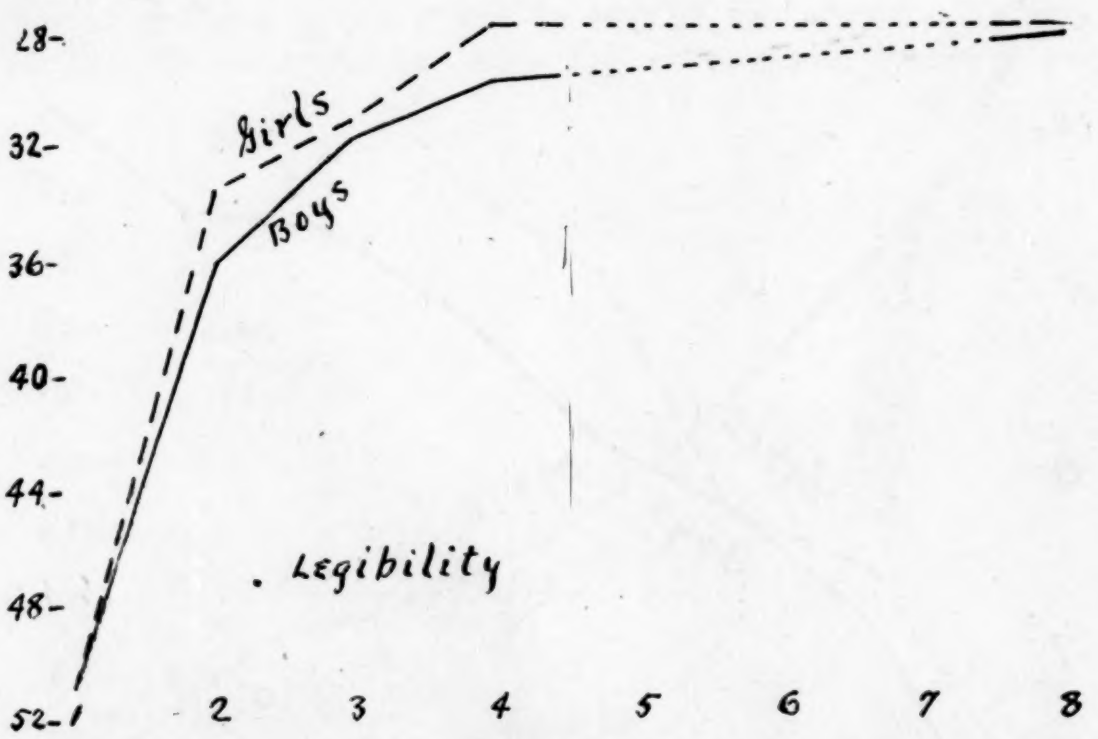

FIGURE IV.

[7]If any one wishes to make his measurements of legibility comparable to the ones in the chart he can reduce them to the basis of this standard graph chart by comparing his speed of reading with my own by means of the samples in the Ayres and the Thorndike scale. See Tables II and III.

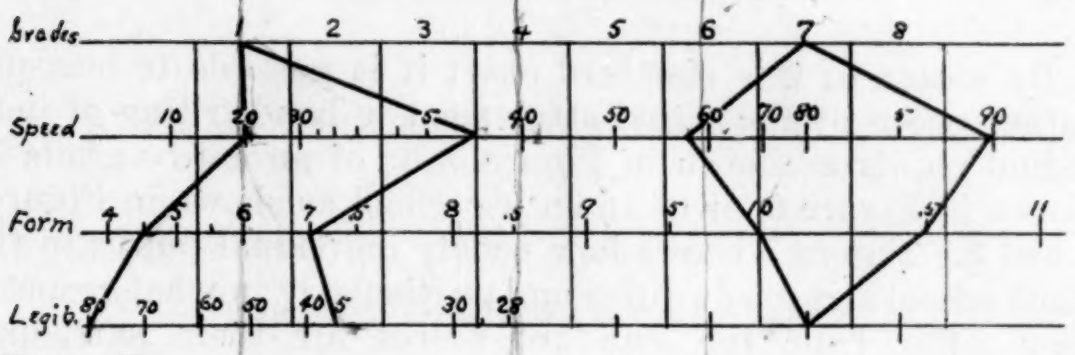

FIGURE V. Indiridual pupils in same school.

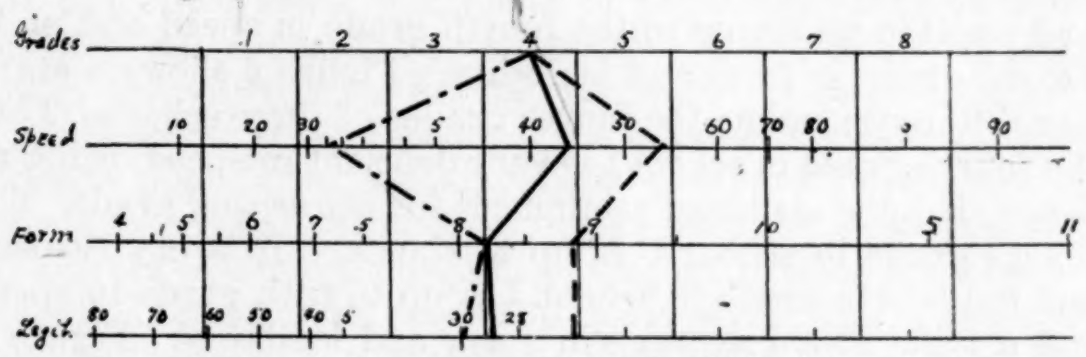

FIGURE VI. Averages of 4th grade in
School J – – –
" C ———
" I —·—

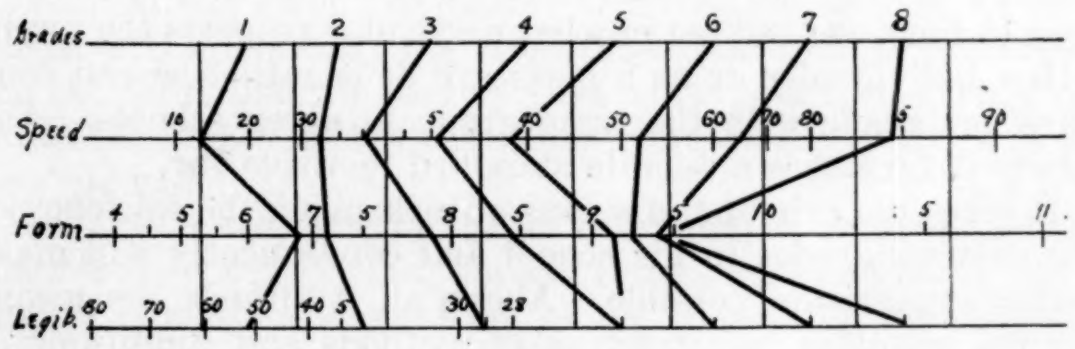

FIGURE VII. Grade Averages of School A.

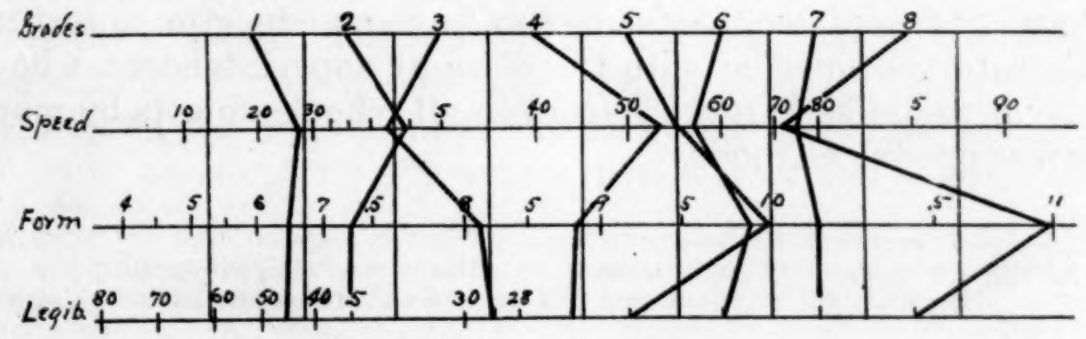

FIGURE VIII. School J. Grade Averages.

By means of this standard chart it is possible to measure rather precisely the actual attainment in handwriting of individual pupils as shown in Figure 5, or of an entire grade as shown in Figure 6, or of an entire school as shown in Figures 7 and 8. Figure 5 shows how widely individual pupils in the same school and grade differ and particularly in what respects they differ from the standard scores for their particular grades. Thus the first pupil in grade one is up to standard in speed but very deficient in both form and legibility. The second pupil is nearly up to the fourth grade in speed and up to second grade in form and legibility. Figure 6 shows a startling difference among the fourth grades of three schools. Thus the fourth grade in school I is very deficient in speed, being no better than the standard attainment for the second grade. The fourth grade in school C is up to standard in every respect, and the fourth grade in school J is up to fifth grade in speed and a trifle above average in form and legibility. Figure 7 shows that almost every grade in that school is below standard in speed. Figure 8 likewise indicates many defects.

The advantages of a precise method of measurement in terms of a standard chart of attainment are quite obvious. A teacher can thereby measure the progress of the pupils from time to time, she can see in what particular respects the pupils either individually or as a class are deficient. She can compare her grade with the same grade in other schools. And finally it furnishes a definite standard to strive for.

It gives the principal a means of measuring the efficiency of the various grades in his school and consequently will make better supervision possible. Above all it affords the means for the scientific investigation of methods and conditions of teaching writing.

In order not to overburden the individual teacher any more than at present, we may some day have an educational testing laboratory connected with the office of superintendent whose duty it would be to test efficiency in all school subjects by more or less precise methods.

A REAL PROBLEM FOR EDUCATIONAL PSYCHOLOGY.[1]

H. H. SCHROEDER,
Whitewater (Wis.) State Normal School.

As a teacher of psychology in a normal school I am naturally most concerned about that phase of psychology that we conveniently call educational psychology. The teacher of psychology in an institution for the training of teachers is first of all interested in those aspects of the science that have a direct guidance value for actual educational procedure, those phases of the subject that throw light on the question as to how the actual work of the common school teacher is to be made more efficient. In our normal school curricula psychology is included under the head of the so-called professional subjects, on the assumption that it will be of real, practical help to the teacher trying to do his work. If it is to be of help to him in his work, we must keep in mind just what that work is, and especially what the most important phases of that work are. Probably no one that has given the matter of education serious consideration will doubt that the most important and at the same time the most difficult part of that work is that of trying to realize the aim of moral education or social education, call it what you will.

And that is why one of the most important considerations, if not the most important consideration, of educational psychology should be the problem of the sources of human conduct. The men and women engaged in the actual work of teaching children and young people are everywhere confronted with the demands for a more efficient moral education. They are ready to admit the justice of the demands, but they cannot help asking: "How are we to bring it all about?" They turn, not only to the educationist, but as well to the psychologist, for help, asking for light on the problem of the sources of

[1]Read at the joint meeting of the Western Branch of the American Psychological Association and the Association of Teachers of Psychology in Normal Schools and Colleges, held at Evanston, Ill., March 21 and 22, 1913.

human conduct, for they realize as we may not that the crux of the whole problem of moral education lies right at this point. We certainly cannot deny that, if the developing of morals is really as important as we claim it to be, we ought to devote a considerable time to the psychology of conduct, or behavior, in other words, to make a psychological study of the springs, or sources, of conduct. Anyone who, with this in mind, has made it a point to examine our standard works in educational psychology, even those of most recent appearance, cannot have failed to be struck by the almost universal neglect of this particular problem, the very one that looms up largest in our minds when we consider the real purpose of the study of psychology in our institutions for the training of prospective teachers. I confess to a similar feeling of disappointment and misgiving at the absolute omission of any reference to such a problem in the report of the committee of the American Psychological Association on the teaching of psychology, submitted about three years ago.

We teachers of psychology in normal schools serve as a sort of buffer, as it were, placed between the university psychologist, on the one hand, and the prospective teacher of children on the other. The latter is to be prepared for his work by us. We cannot give that preparation unless the former, the academic psychologist, gives us what we need for that preparation. And our most urgent need now is more light on this problem of the springs, or sources, of human conduct. In the absence of such a psychological basis for educational principles all talk about a science or art of education is mere bombast and fustian. Now to be candid we must admit that there is little indeed in psychological literature and in that of the kindred branches of science and philosophy that is available in convenient form to give to our teachers so as to help them out in their plight. The standard works on ethics do not approach their problem from this particular angle, and so they have little to offer in a shape to be utilized for guidance in the actual work of teaching. Such inquiries as Bosanquets' "Psychology of the Moral Self," Irons's "Psychology of Ethics," Prof. Davies's "The Moral Life" will be found on examination to be not concerned with this our specific problem. Mei-

nong, Ehrenfels, Eisler, Urban, in their excellent treatises on the psychology of values; Sutherland, Hobhouse, Westermarck, in their masterful works on the evolution of morals; Tarde, Le Bon, Baldwin, Ross, Simmel—all of them deal with aspects of the moral life that have a most direct bearing on our problem of the psychology of moral development, but someone must first work this material into desirable shape to make it available as a practical aid in the solution of our problem. The application of the methods of experimental psychology to the study of educational questions marked an important transition in the history of pedagogy; but this particular mode of research has thus far thrown little or no light on the problem under consideration. Even when we examine such eminently valuable works as Dr. Lay's "Experimentelle Didaktik" and Meumann's "Vorlesungen" with the hope of receiving assistance at this point we are doomed to disappointment.

When we take a look at the history of the question we are struck by the fact that no one has ever come nearer to the first step in its solution than did Aristotle when he said that the whole problem of moral education reduces itself to this: to "get the boy to love the good and hate the evil." This pedagogical maxim is sound because based on a correct psychological analysis. Herbart made a similar analysis when he said that the immediate assurance of moral conduct is found in a "many-sided interest." His "interests" are simply the loves and hates of Aristotle. Where modern psychologists like Wundt, James, Dewey and Baldwin refer us to our primal instincts and impulses as the ultimate springs of conduct they give no new light nor greater aid. Very few psychological or even educational writers have devoted themselves to the study of this problem. Foremost among the few that have seriously attacked it is Dr. Bagley, who, in his "Educational Values," treats the sources of conduct from the biological point of view, terming them conduct-"controls," and separating them into inherited and acquired controls, including under the latter head: habits, knowledge, ideals, tastes and prejudices, attitudes and perspectives.

Anyone interested in this problem cannot help being duly thankful for every new contribution in this field. Yet, with

fullest appreciation of the indisputable value of Dr. Bagley's work as a whole, we can hardly consider his treatment of the problem adequate. In the first place, it involves a peculiarity of psychological analysis that is not entirely free from objections. For instance, the consideration of "perspectives" as distinctive controls is hardly justifiable, for they are secured on the basis of certain habits and knowledge-contents; hence, the latter are the real controls, and not the former. In the same way his "attitudes" are not disparate from ideals or tastes and prejudices. Historically the term attitude has been used in at least three different senses: first, to designate a mental state, or experience; second, the mental disposition which serves as the direct source of such mental state, or experience; third, the objective behavior or action brought about as a response to, or as a reaction of, the mental content. Nowhere does Dr. Bagley tell us in which sense of the term he wishes to use it. As a matter of fact he uses it in all three senses. Where he suggests that attitudes are what the Germans call *Bewusstseinslagen,* he overlooks the fact that this German term designates a state of consciousness rather than the potential or dispositional source of such a state; for right in that connection he quotes from Dr. Judd to the effect that "each individual has his attitudes toward his acquaintance" and "that these attitudes have a stability and sanction which no single impression and no single disastrous result of applying the attitude can overcome," not seeming to recognize the fact that Dr. Judd uses the term in the second sense—something very different from a *Bewusstseinslage.* Generally he uses the term in the third sense, designating thereby the objective reaction which is the response to the mental state; and here the attitude is not a conduct-control, but conduct itself.

But even if the psychological analysis could be accepted *in toto,* the question might well be raised whether this analysis is any more serviceable for practical purposes than the older one that would speak merely of our interests, our likes and dislikes. My own observation of students in their attempts to secure a mastery of the problem leads me to think that they struggle less with the latter simpler way; and furthermore,

that this latter way is less apt to lead to error in procedure than is the more complicated scheme of Dr. Bagley's. I am convinced that the most satisfactory way of getting our students to secure a working knowledge of the sources of conduct is to attack the problem from the standpoint of the psychology of values, to get them to look upon behavior as springing from our sense of values, our likes and dislikes.

But, whichever view of the matter we take, the real difficulty is still unsolved. As regards the science, or theory, of the matter it is of course incontrovertibly true that to solve the problem of moral education it needs but to develop with Aristotle the proper "loves" and "hates," with Herbart the proper "interests," and with Bagley the proper "controls." But when the teacher, practically engaged in the work of applying these scientific principles, asks: "*How* am I to get the boy to love the good and hate the evil?" "*How* am I to develop those interests?" "*How* am I to secure those various controls?" she meets with a Sphinx-like silence on the part of all her advisers. It is true, Aristotle tells her that we become just by doing just deeds, that is to say, we learn to love justice by practicing justice; Herbart tells her that his interests are developed on the basis of "complete thought-masses;" Bagley is perhaps even less specific than Aristotle and Herbart when it comes to the formulation of clearly-defined principles for guidance.

Now it is right at his point that educational theory and practice must necessarily break down unless supported by a better psychological analysis than is available at the present time. Certainly educational psychology ought to be able to illumine the problem with a stronger and a brighter light. Having been convinced for years that it is right at this point that we ought to help out those that are to do the actual work of educating the rising generation, I have tried to formulate a few working principles on the basis of all the aid that I could get from a great variety of sources, and yet, in spite of diligent and painstaking application, the result is rather meagre and disappointing. Every voluntary act is prompted by a regard for some object. But regard for any other object than self is secured only on the basis of some sort of identification

of the self with the object. Where such identification with the object is pleasurable or agreeable, it develops a liking for the object, other things equal; where it is painful or disagreeable, it develops a dislike. Where the identification comes about in the form of knowledge about or acquaintance with the object, for instance, it develops a liking for the object, if the knowledge gained has been pleasurable, but a dislike if painful, other things equal. In the same way, appreciated benefits of any kind, material or otherwise, obtained or expected, create or enhance a liking, while injury or harm, received or expected, arouse dislike. Lastly, and most important perhaps of all, the more we do for the object, the more we render service to it, the more we do in its cause, other things equal, the greater our liking for it, while injuries done to it or opposition given it, will only create a new dislike or intensify an old one.

These principles, crude as they are, and involving certain logical and psychological difficulties as they do, yet serve an important practical purpose: young students of educational problems can comprehend them and apply them in such a way that in their teaching and in the general supervision of school activities they make their appeal to those forces that will assure more desirable conduct in their pupils. Yet there is urgent need of clearing up the many psychological difficulties involved in the problem, so as to make practical procedure at the same time more reliable and more efficient. It is hardly fair to throw the responsibility for the matter on those of us who are teaching in the normal schools. Our duties are so manifold, and the demands on us so varied that even given the ability to make such an investigation, we could not do it for lack of time and of energy. And so I hope that the time is near when the academic psychologist will be willing to renounce for once the claims of pure science and give practical assistance to those in urgent need of it. Or are we to conclude with James, with Muensterberg, and others that psychology can render no real service to pedagogy? I for one am not ready to accept such a view, and am eagerly waiting for the publication of Prof. Thorndike's lectures on the "Springs of Conduct," and hope that other psychologists will consent to devote a little serious attention to this important problem.

BINET-SIMON TESTS AT THE GEORGE JUNIOR REPUBLIC.

H. M. JENNINGS AND A. L. HALLOCK.

Cornell University.

Communicated by G. M. Whipple.

(Studies from the Cornell Educational Laboratory, No. 15.)

PURPOSE OF THE INVESTIGATION.

Recent work with the Binet-Simon tests has demonstrated that a considerable percentage of delinquents are below normal in mentality, and many institutions devoted to corrective treatment have found it worth while for this reason to supplement the ordinary physical examination by the use of the Binet and other forms of psychological tests.

The George Junior Republic, at Freeville, N. Y., is an institution too well known to our readers to need description here, but it may be pointed out that the general plan of work for the boys and girls entrusted to its care has always presupposed the presence in the 'citizens' of ordinary intelligence, or at least of a grade of mental ability above that characteristic of any form of feeble-mindedness. The aim of the Republic is to duplicate in miniature the economic, civic and social life of a real democracy. The one hundred and fifty or more boys and girls, in their work on the farm, in the printing office, laundry, bakery or carpenter shop, earn all they possess and gain, as their motto reads, "Nothing without Labor." Add to this that systematic school instruction is given to all the members of the community and that all the rules and regulations of their daily life are made and enforced by the citizens themselves, and it will be seen that the Republic is no place for the mentally in-

competent. And experience has, in fact, shown it to be inadvisable to admit children less than twelve years of age.[1]

Now it would seem a fair presumption that the aim of the Republic—to make industrious, self-reliant, moral men and women of boys and girls who, though wayward, criminal or immoral, are still physically and mentally sound—cannot be met if the entrant be *mentally* less than twelve years of age, even though chronologically older, or at least if the disparity between his mental and his chronological age be sufficiently pronounced to indicate real deficiency or any considerable degree of retardation. The fact, then, that a few of the citizens at Freeville had failed to benefit as they should have by the remedial and educational agencies of the institution led Supt. Burch to request the Education Department of Cornell University to carry out tests of mental status upon these more troublesome cases.

In a series of half-day clinics held at Freeville, February to June, 1913, we applied Goddard's revision of the 1911 Binet-Simon tests to 20 boys and 6 girls. These 26 cases included not only the troublesome cases above mentioned, but also four newly admitted citizens, the citizen "president" of the Republic and a few other prominent citizens of undoubted ability, who were examined partly as a check upon the method and partly because the nature and purpose of the testing had in some way become generally known and had created an adverse sentiment against being tested—the report gained currency that any citizen who was invited to the clinic was *ipso facto* "a fool."

The Results.

The following data indicate clearly enough the outcome of the work, save that a word of explanation is perhaps called for with regard to the figures in the fourth column. These figures show the value of the "mental quotient" for all cases in which the mental age falls below 12 years. This quotient, which has recently been urged by Stern[2] as affording a more valuable in-

[1]While the coincidence may be accidental, it is of interest to note that a mentality of 12 years is generally conceded to mark the upper limit attained by high-grade defective children.

[2]Die psychologischen Methoden der Intelligenzprüfung. Leipzig, 1912. See especially pp. 55-ff.

An English translation of this volume will appear soon in the Educational Psychology Monographs.—*Editor.*

dex of deficiency than the customary statement of the absolute difference between chronological and mental age, is computed by dividing the mental by the chronological age, and thus affords an index of relative retardation. The quotients in the table have been multiplied by 100.

Case No.	Chronological Age.	Mental Age.	Mental Quotient.	Comments.
1	18	8.5	47.2	Moron or high-grade imbecile
2	19	11.5	60.6	Moron
3	15	11	73.4	Probably moron
4	15	11	73.4	Probably moron, needs glasses
5	18	14	....	Normal
6	13	12+	....	Normal, rather bright
11	17	10+	61.8	Moron, tested twice
12	16	10	62.5	Probably moron
13	17	10	58.8	Moron
14	15	11.5	76.6	Probably defective, lazy, needs glasses, narrow memory span
15	16	12+	....	Below average in intelligence, but not defective, needs glasses
16	15	12	....	Poor intellectual grasp, but probably not defective
17	17	12	....	Nervous, needs retesting, probably poor intelligence
18	17	15+	....	Normal, slow, persistent
19	18	13	....	Slow, but not defective
20	19	13	....	Tested under poor conditions, seemed bright
21	15	13	....	Not defective, but weak in some respects, needs glasses
22	17	15+	....	Normal
23	16	14	....	Normal
24	14	13	....	Normal
25	14	12+	....	Normal, weak in use of language
26	15	14+	....	Normal
27	16	15+	....	Above normal, exceptionally good in higher ages
28	16	13	....	Normal though short of his chronological age, bright
29	18	15+	....	Normal
30	20	14+	....	Normal

It will be seen that of the six girls tested (Nos. 1 to 6) the first two are defectives and the next two probably defectives. Nos. 1 and 2 should be removed from the Republic and Nos. 3 and 4 should be retested for signs of improvement. Of the 20 boys tested (Nos. 11-30), three (Nos. 11, 12 and 13) rank as

morons and should be removed from the Republic. The next four cases give evidence of inferior intelligence, though not clearly mentally defective so far as the examination went. They are borderline cases and need further study. The remaining thirteen boys show normal intelligence.

The mental quotient, as might perhaps be expected, is of very dubious value when applied to cases whose chronological age is much over 12. In only two cases (Nos. 3 and 4) do our quotients accord with Stern's tentative ascription of the values—.62-71 to imbeciles, .71-77 to morons, .80-84 to doubtfully defective, and .90 + to normals. For groups like the one under investigation it is not so much the amount of retardation, whether absolute or relative, as it is the absolute mental age, that is significant.

Difficulties in the Use of the Tests.

The chief obstacle in the application of the Binet-Simon tests to the citizens of the George Junior Republic is the very obvious one of the insufficiency of the tests for ages above 12. Our subjects ranged from 13 to 20 years; most of them were 15 years or over in chronological age. The lack of any tests for mental ages 13 and 14 made it difficult to apply any statistical rules to the evaluation of ages above 11, because of the too small number of tests upon which the valuation had to be based and because of the obscurity of the method to be used with even the limited number of tests at our command. Take, in illustration, Case 20. This boy passed all the tests for age 10, which therefore becomes the base for the computation of his status. He also passed four tests of the next year, three of the year after, three of age 15 and three of the adult tests. Under strict interpretation he would seemingly score $10 + 13/5 = 12.6$. But the fact that he passed three of five tests for adults and the same number for fifteen-year examinees would seem to warrant a better standing. Or, to put the matter in another way, had there been tests for ages 13 and 14, it would seem probable that he would have passed at least five of those ten additional tests and this would have added a year to his standing.

Without wishing to place too much emphasis upon our opinion, we have the impression that the code test (XV, 3) is too difficult, and exacts too much time in proportion to the value to be obtained from it.

Our experience, short as it is, has also confirmed our belief that the Binet tests should be given only by those who have been trained in laboratory methods in psychology. It is difficult to see how an examiner without such training would be able to maintain standardized conditions and yet at the same time make such skillful adaptation of the details of method as to meet judiciously those variations that are constantly arising in the attitude and responses of the subjects under test.

Despite these and other minor difficulties, the tests have served a real purpose in the practical administration of the Freeville Republic, and it is planned that in the future no applicants for admission to citizenship will be received until their mental status has been scientifically determined.

COMMUNICATIONS AND DISCUSSIONS.

THE FOURTH INTERNATIONAL CONGRESS ON SCHOOL HYGIENE.

From Monday, August 25th, to Saturday, August 30th, the city of Buffalo was the Mecca of hundreds of superintendents, school medical inspectors, school nurses, teachers, health officers, college professors and numerous laymen who were concerned with the forward movement for the health of the child at school. In so far as attendance on the part of the general public, space in the newspapers and other secondary signs may be taken as criteria, this Congress accomplished at least one phase of its purpose, viz: the intensification in the popular consciousness of the notion that school and educational conditions during the plastic period are of decided importance for healthful physical and mental development and that there exists a sufficient body of facts and principles, some of them precise and scientific, some of them, to be sure, as yet ill-digested and perhaps inaccurate, to warrant a place for school hygiene as a special branch of sanitary science.

On the scientific side we can speak only of our own impressions. To a critical observer there seemed to be rather too much arm-chair opinion where hard-won facts would have been more welcome and too great readiness to flaunt personal opinion where objective demonstration would have been in order. Our general impression, reached with reluctance, was that school hygiene, though making progress, is still far from an exact discipline. There was certainly manifested at Buffalo a tendency on the part of practical men with only semi-scientific training, like physicians, school inspectors and administrators, to discuss at length topics like heating, ventilation, open-air schools, mental hygiene, mental tests, etc., in a manner which evinced more eagerness to arrive at a working hypothesis or perhaps even more eagerness to be heard in public than to make permanent contributions to the advancement of scientific knowledge. Doubtless this impression was developed in some part by the discussions which followed the presentation of the formal papers. In many sections the chairmen made no effort to hold the participants in these discussions to the time-limit announced, nor to the topics presumably

under discussion. Moreover, as is usual when discussions are thrown open to the public, those who spoke longest and oftenest frequently had the least to say.

The sessions were also sadly interfered with by the lack of proper seating facilities: there was nearly enough room, but much of it empty of chairs, while it was quite impossible for late-comers to make their way at all into the rooms when popular or well-known speakers were holding forth.

To mention specific papers in any short report of the Congress is well-nigh impossible, because there were so many from which to choose. The program comprised the bewildering number of 44 separate sessions, to say nothing of concurrent exhibitions, symposiums, receptions, excursions, conferences, and simultaneous meetings of other bodies with allied interests. The morning programs, for example, generally embraced six simultaneous sessions, while there were in all some 450 contributors to the general program and more than that number of papers.

Some idea of the scope of the Congress may be gained by an enumeration of several topics to which sessions were devoted. We may mention open-air schools, school buildings and their equipment, fatigue and nervousness in school children, instruction in hygiene, mouth hygiene, mental hygiene, the ventilation, heating and cleaning of school buildings, sex hygiene, medical inspection, play and athletics, crippled children, health and supervision of college and university students, the conservation of vision, school feeding, school illumination, tuberculosis among school children, school nurses and school clinics, and mental tests of school children.

Two of these sessions may be selected for brief comment. The first of these is the symposium on sex hygiene held at the Elmwood Music Hall. There were many who commented upon the serious interest displayed by the audience of 2500 people, who listened intently during a long afternoon to the addresses upon this topic. We think it is safe to say that ten years ago, perhaps even five years ago, such an audience could not have been gathered, or at least such a respectfully earnest audience could not have been gathered for the purpose that animated the one at Buffalo. This, of itself, shows that the public agitation for a better understanding of the problem has made headway. There was undoubtedly sympathy felt by the greater part of the audience for some sort of attempt to move forward and aban-

don the "policy of silence" in matters of sex instruction. The addresses, in particular that of Ex-President Eliot, were of remarkable caliber, even the antagonistic presentation of the representative of the Roman Catholics was notable as a bit of oratory, however sophistical one might have felt it to be as a bit of logical exposition.

Another session of interest to the readers of this magazine was that devoted to the Binet-Simon tests. The papers presented at this session were all quite technical. They showed among other things, a division of opinion as to the practicality of the scale, and especially as to its value in the hands of amateurs—a matter that was naturally somewhat disconcerting to many of those in the audience who would have preferred to have listened to a wholesale endorsement of the scale at the hands of the experts on the program. Indeed, one may raise the query whether there is not a certain measure of reason in the complaints of those who after the meeting privately expressed their sorrow at what seemed to them a hypercritical attitude toward the use of the scale by school administrators (the regular discussion was unfortunately brought to a sudden termination by the advent of a 'crank' who could not be induced to leave the platform). And, again, this session brought out a difference of opinion as to whether tests of the simpler mental processes were of practical benefit in the schools or whether tests of complex processes, like Binet's, were needed. Doubt was also cast on the accuracy of some of the recently published work upon the extent of feeble-mindedness in school systems, among delinquents, etc.

As is usual in such gatherings, most of the delegates profited more by the opportunity for personal exchange of ideas at informal meetings outside the regular sessions. One such meeting, especially, made headway in an attempt to settle certain important questions relating to the Binet-Simon tests. It is hoped to publish in this JOURNAL in the near future the substance of the conclusions reached.

In closing, a word of commendation should be said for the very elaborate and interesting scientific and commercial exhibit, and especially for the adjunct to the exhibit, prepared by Dr. Dresslar, and open to teachers especially interested in school hygiene, wherein the greater part of the contributions to the literature of school hygiene had been classified, annotated and displayed for examination.

G. M. W.

ABSTRACTS AND REVIEWS.

EDMUND BURKE HUEY, A.M., PH.D. *Backward and Feeble-Minded Children. Clinical Studies in the Psychology of Defectives, with a Syllabus for the Clinical Examination and Testing of Children.* Baltimore: Warwick & York, 1912. Pp. xiii, 221. $1.40.

The social surveys of the past ten years have begun to show us how serious is the problem of mental defect in modern civilization. In England and Wales it has been found that there is one mental defective of some sort to every 125 of the population, and it is probable that the percentage is just as high in this country. Moreover it would seem that the percentage of mental defect is increasing rather than diminishing. Some, it is true, claim that the increase is only apparent, that our censuses are now much more accurate and thus many who would have been overlooked before are now reported, that the dividing line between normality and mental defect is now more sharply drawn, and thus those who were formerly labeled "queer" are now called feeble-minded. But even after making allowance for all these contingencies others insist that there is an actual increase in the relative number of abnormal human beings. This increase has been accounted for on two grounds. On the one hand the increased pace of living, the strain after more money, more of the luxuries of life, more show and glitter, more rapid rate of accomplishment in all lines, keep us keyed up to a higher pitch of nervous tension, and any slight tendency to mental defect thus receives its full measure of development. Thousands of those who in a former generation would have lived out monotonous, humdrum lives like straws upon the placid bosom of a sheltered lake, are seized by the swift current of excitement and nervous strain, and dashed to pieces on the rocks of mental wreck. On the other hand the biologists tell us that the law of the survival of the fittest has been suspended by our sentimental protection of the weak, that the feeble-minded, owing to their inability to foresee results and check their animal impulses, propagate much more rapidly than the normal

population, and that gradually but surely their poison is infecting the whole body politic. If the latter interpretation adequately represents the facts, and many recent studies seem to confirm this view, the question "What shall be done with our feeble-minded?" becomes one of vital social import.

The first task in connection with the feeble-minded is obviously to find them, and as the author points out there is no place where they may be found more easily than in the public schools. We may say if we like that the schools should be for normal children, that the feeble-minded have no business in them, that they should be segregated and placed in separate institutions. The fact remains that they are in the public schools now and will continue to be in them for many a year, and it is incumbent upon school authorities to detect them, to remove them from the regular classes, and to give them such training as they can take and profit by.

In this task of the diagnosis and classification of mental defectives the present book will be of great assistance. The introductory chapter sets forth the need for the study of the feeble-minded, and the advantages offered for such study in the special institutions for the feeble-minded. The second chapter deals with classification and terminology, and in it the author adopts the usage of the American Association for the Study of the Feeble-Minded, according to which the term feeble-minded is applied to all degrees of mental arrest, and this large class includes the three sub-classes, idiots, imbeciles and morons. Those defectives whose mental development never exceeds that of a normal child of about two years are called idiots. If the defective's development is arrested between two and seven years he is called an imbecile, and if his intelligence is higher than this, but does not exceed that of a normal child of twelve, he is called a moron. In addition such descriptive terms as cretin, Mongolian, epileptic, etc., are found convenient.

In the third and fourth chapters, which constitute the body of the book, we have detailed clinical pictures of thirty-five high grade morons, or border-land cases. In these studies we have the general description of the subject, the results of the physical examination, the previous history and home conditions so far as they could be obtained, the mental age as determined by the Binet tests, and the results of other mental tests, as the cancellation test, story reproduction, story invention, orientation, similars, opposites, and the

Kent-Rosanoff association test. Chapter five deals with the tabulation of the data, and chapter six presents syllabus for the clinical examination of children. This syllabus is also published separately, and gives a complete account of the methods used in securing the data presented in the text. In addition the publishers issue the record blanks used by the author, including clinical reference cards, the Binet-Simon tests, home record and history, school report, a point scale of tests for intelligence, and directions for giving and scoring point scale tests. These record blanks are to be had at forty cents per dozen, and are a great convenience to those who engage upon the testing of children.

The book forms a valuable contribution to the technique of mental testing, and will be of great assistance to those who are engaged in the task of detecting and classifying backward and feeble-minded children. J. C. B.

The History of Modern Elementary Education. SAMUEL CHESTER PARKER. Boston: Ginn and Co., 1912. Pp. xxvi, 505.

This work aims to give an account of the history of modern elementary education, paying special attention to school practice in its relation to social conditions.

The first of the four parts into which the book is divided is devoted to the definition of the term "elementary education" and to a lucid and convincing account of the conditions which hindered the development of elementary vernacular schools during the Middle Ages.

The progressive secularization of the schools is selected, rather happily, we think, as the central theme about which are grouped the main facts of the history of elementary education from the Renaissance to the present. The second part of the work treats of the elementary schools on a religious basis, the third part treats of the partly secularized, and the fourth and concluding part of the completely secularized elementary schools.

Perhaps the chief merit of the book is a certain clearness and force of presentation due largely to a skilful selection and organization of material.

For the plan of the work as a whole the author acknowledges his indebtedness to Robinson's "History of Western Europe" and similar works. The essential features of the plan are: (1) The inten-

sive treatment of a limited field, (2) emphasis upon a few representative movements, institutions and individuals, and (3) the treatment of these in a concrete manner.

A striking feature of the book is the extent to which it exemplifies the application of the Pestalozzian, Herbartian and other educational principles which it describes. In the first place, it contains numerous illustrations of schools and school equipment as well as portraits of eminent intellectual leaders and educators, and photographic reproductions of pages from famous school texts. Secondly, a summarized statement of contents precedes each chapter and prepares the mind of the reader for the assimilation of the material to be presented. Frequent topical headings in black-faced type and italics assist to the same end. Finally, the author not infrequently turns aside from his subject to keep his reader informed as to his aims and as to the relation of the topic under discussion to those which have preceded it and to those which are to follow.

Another feature which adds to the value of the book is the number of instances in which errors of commission or of omission in earlier works on the subject are rectified. Let us take as an example the subject of the gild schools. Most histories of education have been inclined to ascribe the establishment and maintenance of these too exclusively to the craft and merchant gilds. Mr. Parker's book is one of the first to do justice to the work of the social and religious gilds. Another instance deserves, perhaps, special mention. The work of J. H. G. Heusinger, an educator and an original and forceful educational writer especially active in Germany during the Napoleonic period, has hitherto been strangely neglected by English and American writers on education. Not only was he one of the most progressive educational thinkers of the time, but in his emphasis upon the utilization of the play impulse and of handwork as means of education, in his recognition of the superior ability of women as educators of young children, and in other respects he anticipates not a few of the important features of Froebel's system. Mr. Parker's is perhaps the first American history of education to mention Heusinger and to point out Froebel's indebtedness to him. The story that a well thumbed and annotated copy of Heusinger's "On the Utilization of the Child's Impulses to Activity" was found in Froebel's library after his death is repeated by Mr. Parker and so positively as to suggest that he has more direct and

definite information than that contained, for instance, in Rissmann's Geschichte des Arbeitsunterrichts (p. 25, note).

The work abounds in quotations, but these are as a rule so apt and so cleverly introduced as to retard but little the flow of the narrative.

Less successful, it seems to the reviewer, has been the organization of the material in the latter half of the work.

Whatever merits the plan of making the secularization of the school the central theme may possess it presents difficulties which the author has been only partially successful in overcoming. It is likely to suggest that the process of secularization was more steady and continuous than it actually was. It creates a tendency to underestimate the influence upon education of the religious movements subsequent to the Protestant Reformation. It is this, perhaps, which accounts for the omission of any reference to the important work in elementary education of Francke and other pietists in Germany.

The chapter entitled Pestalozzian Industrial Education would be more complete did it lay more emphasis upon the *development* of the Swiss reformer's views as to the aim and method of manual and industrial education. The psychological arguments for hand training set forth by Pestalozzi in *How Gertrude Teaches Her Children* (chap. XIII) may well have exerted as marked an influence on Froebel as his views as to the economic importance of hand training did upon Fellenberg.

The book as a whole is an eminently successful attempt to convey to the reader in a clear and attractive manner the main facts of the history of modern elementary education. Wise selection and effective arrangement of material, clearness and directness of style and aptness of illustration combine to make it one of the most helpful books hitherto written on the subject.

L. F. ANDERSON.

School of Education, University of Illinois.

ANNA G. NOYES, B.Sc. *How I Kept My Baby Well.* Baltimore: Warwick & York, 1913. Pp. 193. $1.25.

This book is not a medical treatise on the care of infants, but it may be used with profit as a supplement to such a manual, and it goes far toward furnishing the data needed as a foundation for the

generalizations of medicine. Medical books usually deal with "the average baby," or present typical forms of diseased conditions. Such averages and type studies have their value, but it is the individual that we are concerned with in the task of raising healthy and vigorous members of the coming generation. The present book gives us a careful study of the development of an individual baby. It is, of course, not the first detailed study that has been made of a single baby. We have many records of individual children from Darwin and Preyer to Dearborn, but all of these are made from the standpoint of behavior and particularly the development of conscious control. The book under consideration is unique in that it contains a complete and detailed record of an individual baby for two years, taken solely from the point of view of health. And what is of more practical and vital importance in the development of an infant than health? It is indeed interesting to study the early reflexes, to watch them become modified into more or less skillfully controlled adjustments, to note the early manifestations of intelligence, to trace the course of speech activities, and to chronicle the feats of memory. But even the skilled specialist can modify these phases of development to only a slight degree, while health is fundamental to them all, and yet can be seriously disturbed by the least negligence. The carelessness and ignorance of mothers and even of many physicians in regard to the amount and kind of care that an infant should have makes it surprising that infant mortality does not reach even higher percentages than those we read about. Yet how can young mothers be anything but ignorant when they are taught all sorts of things from fashions to Sanskrit except the care and training of children? It is a curious anomaly that the work which is of the most vital importance to the welfare of the race is totally neglected in our provision for the education of girls. It is encouraging to note that a school of mothercraft has recently been opened in New York City, but its influence will necessarily be limited to a few. The need for instruction is general, and the place where it should be given is in the upper elementary grades and in the high school.

Even physicians have little exact knowledge of the finer details of infant health. There are no data available for scientific treatment. Hospital records give a picture of disease, but are of little value for the prevention of disease. We need a large number of just such detailed and careful records of individual children as this book pre-

sents. Only upon such a series of health studies as a basis will it be possible to construct a genuine science of infant health.

Space will not permit a discussion of the record in detail. The author gives a minute description of her observations during nine typical months, and summarizes the account for the remainder of the first twenty-five months of the child's life. The months selected for detailed treatment are the first and the twenty-fifth (which mark the beginning and the end of the study); "two of the most perfect months, the seventh and the twenty-first, the one before and the other after weaning; and a group of five months, each of which contained a particular problem, as follows: the second month, the problem of regurgitation, the sixth month, of overfeeding, the ninth and tenth months, of weaning and a cold, and the twenty-fourth month, that of teething."

The book is provided with a detailed index, which adds greatly to its usefulness as a work of reference, and is enriched by more than fifty photographs and thirty-seven charts. J. C. B.

HELEN C. PUTNAM, A.B., M.D. *School Janitors, Mothers and Health.* Easton, Pa.: American Academy of Medicine Press, 1913. Pp. 211.

This helpful little volume represents a revision and extension of papers previously published by Dr. Putnam in the *Child-Welfare Magazine,* the *Journal of the American Public Health Association* and the *Proceedings of the National Education Association.* It does not pretend to be a textbook in school hygiene, though it might serve well for required reading by students in normal schools and colleges; its primary mission is to arouse and encourage mothers of school children to take an active and intelligent interest in the sanitary and hygienic condition of schoolhouses, to convince mothers that they should and could bring about conditions of healthfulness inside the walls of the schoolroom as satisfactory in every whit as those they insist upon securing and maintaiuing in their own homes. To the reviewer this aim seems as important as it is laudable. With a few exceptions, perhaps most notably in the State of Texas, organizations of women have not risen to a full realization of the power for good they might wield in practical application of the fundamental principles of school hygiene.

The five chapters of the book deal with the prevention of school

fatigue, mothers' clubs and clean schoolhouses, the relation of the janitor to school health, the problem of janitor service and the training of janitors. These chapters are subdivided into topics which are assigned for consideration by women's clubs in the programs of a series of monthly meetings. Particularly commendable is the insistence on precision and care in the collection of data, and the intelligent use of instruments of precision in the study of actual schoolroom conditions. At the same time the personal and narrative tone of the whole book removes it from the danger of frightening away its prospective audience by any impression of coldly scientific didacticism.

G. M. W.

THE
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The Journal is issuing a series of Monograph Supplements for the publication of more extensive researches in educational psychology. For details prospective contributors may apply to Guy Montrose Whipple, Cornell University, Ithaca, N. Y.

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EDITORIALS.

THE 'CASE METHOD' IN EDUCATIONAL PSYCHOLOGY.

The very general success of the 'case-method' of instruction in schools of law raises the question whether a modification of that method might not be valuable for classes of prospective teachers who have acquired a fairly comprehensive familiarity with the facts and principles of educational psychology. It would be impossible, of course, to force the analogy between the study of law and the study of education very far, because the principles of law have been derived by quite another method than those of psychology and the typical legal 'case' presents somewhat different aspects to the student than would the cases that might be brought before the student in education. Yet, there is at least the similarity that both would call for analysis of a concrete situation and the application to it of principles previously learned. What I have in mind is possibly better characterized as a kind of class-room clinic for the discussion of concrete problems arising in practise.

The following are samples of the 'cases' that I have in mind,

though I should expect in each case to give many more data than can be cited just here. (1) A young man in his second college year can not commit to memory without the greatest difficulty any material demanding verbatim reproduction. What are the theoretically possible sources of his trouble; how should his case be investigated; what suggestions can be given to assist him? (2) The father of a left-handed boy in the kindergarten is very anxious that the teacher should compel the use of the right hand. Should the teacher advise the attempt; if not, why not? (3) A parent asks at what age it is best for her child to begin the study of a foreign language. What is the proper answer and why? (4) Could a teacher in the third grade train her pupils to concentrate attention by the use of formal exercises with a revolving blackboard? (5) A child is suspected of being mentally defective. What method can be used to investigate his status? What symptoms would indicate real deficiency? What improvement may be expected from educational treatment? (6) A high-school principal would like to know what curriculum would afford the best all-round mental training. What subjects are to be suggested and what training value may be expected from each of them?

It would surely be not difficult to extend these samples and even to concoct a 'case-book' of ample dimensions. If the last two or three weeks or more of every course in educational psychology could be devoted to the discussion of such concrete problems, the dangers of barren verbalism from text-book study would, I believe, be largely overcome. G. M. W.

NEW COURTIS TESTS IN ARITHMETIC.

The growth of interest in mental tests and increasing use of them in school work constitute a most significant movement in modern education. Simple tests of attention, perception, association, memory, imagination and invention are coming into use more and more generally as indices of the original mental endowment of the child, while the Binet tests offer a graded series of complex, every-day tasks which have proved remarkably useful in making rough determinations of mental age. Owing to the fact, however, that the materials of most of these tests are greatly simplified and schematized, and that the subject matter and methods of attack are quite different from the ordinary work of the schools,

there is a justifiable skepticism as to their precise significance for teachers and superintendents. It is true that we need to know more about the elementary mental processes of the school child, but what is also needed, and what would be of much more direct advantage to the teacher, is a system of scientific tests in school subjects. The Courtis Standard Tests in Arithmetic marked an important step in this direction, and their use in the scientific investigation of educational conditions in New York, Boston, Detroit and other cities, and their employment by hundreds of teachers throughout the country for a more accurate determination of the arithmetical abilities of their pupils, indicate the high esteem in which they are already held. Extended work with these tests has convinced Mr. Courtis, however, that other and simpler arithmetical tests are needed,—tests that more nearly approximate the arithmetic work of the schools. Accordingly, he has devised a set of four tests, one for each of the fundamental operations, each containing twenty or more examples of the sort usually set at school, but so constructed as to include systematically all of the elementary combinations. The author denominates these tests Series B, Arithmetic, and speaks of them as follows:

"The work done with Series A has proved that the basic problem in education today is that of ministering adequately to individual needs. The first step toward this end is the formulation of definite objective standards. The standards derived from the use of Series A, however, are either complex or of questionable value, owing to the uncertainty of their meaning. This is particularly true of the reasoning tests in which mere ability to read is a large factor.

"Accordingly, Series B represents an attempt to secure definite, objective standards for each of the four operations with whole numbers,—addition, subtraction, multiplication, and division. On the basis of the knowledge gained from Series A, a test has been constructed for each operation to serve as a general measure of ability in that operation. The test in addition, for instance, consists entirely of addition examples, each three columns wide, each column nine figures long. The figures are so chosen that all the fundamental combinations are represented. The time allowance is eight minutes. The test as a whole and in its component parts is thus long enough to measure whether or not a child or class has learned (1) the fundamental combinations; (2) the mechanism of column addition; (3) to carry; (4) to bridge the attention spans; (5) to control the effects

of fatigue; (6) to work at the proper speed; and (7) with proper accuracy. When this test is standardized, it will be possible to set for each grade just the degree of skill in addition that is within the reach of the average child. So for the other operations.

"Series B is issued this year for the first time. It is believed that eventually it will entirely displace Series A except in the solution of certain problems, and that the standards obtained will have a permanent value. The labor of scoring and tabulating is simpler and the cost both in time and money less than for Series A. Its use is advised for beginners."

In order that these tests may have a fair trial in many parts of the country and that the results may be made known and norms constructed, the author offers them on the co-operative terms that proved so successful with Series A. The tests will be furnished at cost (about two cents per pupil) to school authorities who will agree to tabulate the results and return copies of the essential records to the central bureau. Further particulars may be learned on application to Courtis Standard Tests, Department of Co-operative Research, 82 Eliot Street, Detroit, Michigan.

J. C. B.

NOTES AND NEWS.

The city of Lyons, France, is organizing an International Urban Exhibition to extend from May 1 to November 1, 1914. At this exhibition all phases of city life in civilized countries will be represented, and in view of the importance of education in city life especial emphasis will be laid upon the portrayal of school conditions, including school buildings, furniture, materials of instruction, courses of study, methods of teaching, educational tests, and school hygiene. It is desired that "every nation should be represented by an exhibit which will give an accurate and complete notion of the efforts and cares it has devoted to its schools." Such an exhibition will be of great importance in impressing upon the public the value of educational activities not only from an intellectual but also from an industrial and commercial point of view. Those who are interested may obtain further information by applying to Professor Chabot, Hotel de Ville, Lyons.

The School of the Science of Education (Institute J. J. Rousseau), founded at Geneva, Switzerland, through the initiative of Professor Ed. Claparède, and directed by Mr. Pierre Bovet, finished its first year of existence in July. Among its students were representatives of Germany, Armenia, Belgium, Brazil, Spain, United States, Greece, Palestine, Holland, Poland, Portugal, Roumania and Russia. A characteristic feature of the work of the school is the adoption of the seminar conference type of instruction, so that each student carries on his own individual work under the personal supervision of his instructors. This gives rise to an intimate family relationship between students and professors which is of the greatest value. The course of study will be forwarded on application to the Director, at 5 Place de la Taconnerie, Geneva.

At the Conference Exhibit on Mental Hygiene, held at Pittsburgh in April of this year, the following addresses, among others, were of interest to educational psychologists: "Feeble-mindedness and School Children," by E. Bosworth McCready; "Rational Industrial Education of the Feeble-minded," by C. B. Conneley; "The Functions of the Psychological Clinic," by J. E. W. Wallin; "Sex Hygiene in Connection with Mental Health," by Elizabeth Martin, and "Segre-

gation of the Feeble-minded—Protection of the State," by Stanley H. Howe.

The department of clinical psychology of the University of Pittsburgh has issued an interesting bulletin setting forth the aims of the work and the courses offered in 1913-1914. Emphasis is laid upon the proportion of retarded and defective children in the schools, and the necessity for special training on the part of those who attempt to direct their education. Courses are offered in clinical psychology, in the study, care and education of mentally exceptional children, and in psycho-educational pathology and educational therapeutics. Perhaps the most important phase of the work is the dispensary clinic and practicum, in which the student comes into direct contact with defective children, and has practice in examination and diagnosis under expert supervision.

The International Faculty of Paidology at Brussels, under the direction of Dr. I. Ioteyko, has established a new quarterly journal, *Le Paedologium,* to serve as an organ of publication for the activities of the Faculty in the scientific study of the child. It is the avowed aim of the Faculty to contribute to the development of paidology "as a real science in the strict sense of the term," and to this end it will issue three sets of publications: (1) *Le Paedologium,* for the publication of short articles and notes of current interest, (2) *La Revue Psychologique,* which has already made an enviable reputation in the world of scientific literature, and which will contain longer and more technical articles, and (3) *Travaux de la Faculté Internationale de Pédologie de Bruxelles,* a series of monographs on paidological topics. Of these monographs *Ambidextrie,* by V. Kipiani, has already appeared, and the following are announced: *Les Défenses Psychiques: La Douleur, La Fatigue,* a contribution to the study of the education of the emotions, by Dr. I. Ioteyko, and *Rapport entre l'Acuité Sensorielle et le Développement de l'Intelligence,* by Mme. Lipska Librach. The subscription price of *Le Paedologium* is five francs, and the address is 69 Rue de la Culture, Brussels.

In accordance with the recent action of the House of Delegates the educational authorities of Prussia have authorized the establishment at the University of Halle of a chair in pedagogy. This will be the first professorship in pedagogy to be established in any Prussian university. A pedagogical seminar has been organized and placed

in charge of Dr. Alfred Rausch, Director of the Franckesche Latin School in Halle. Dr. Rausch will give instruction in the theory and practice of education.

A fund of $50,000 to be expended in the next four years on experimental studies in ventilation problems has been placed at the disposal of the New York Association for Improving the Condition of the Poor by Mrs. Elizabeth Milbank Anderson. The commission which will have charge of these experiments will include among others Professor F. S. Lee, physiologist, and Professor E. L. Thorndike, psychologist, of Columbia University.

The German edition of Professor Whipple's *Manual of Mental and Physical Tests* is announced by Otto Nemnich, of Leipzig, to appear under the title *Leitfaden für Intelligenzprüfungen,* as Volume 9 of the series *Die Pädagogik der Gegenwart.* The translation and adaptation of the German edition is being done by Professor Meumann, of Hamburg. The second American edition, rewritten and enlarged, is now in preparation.

At the meeting of the National Education Association in Salt Lake City Dr. Joseph Swain, president of Swarthmore College, was elected president, and Dr. Robert J. Aley, president of the University of Maine, was chosen president of the National Council of Education.

Dr. Edward O. Sisson, professor of education in Reed College and previously head of the department of education in the University of Washington, has been appointed Commissioner of Education for the State of Idaho.—*Science.*

The Board of Regents of New York State has appointed Dr. John H. Finley, president of the College of the City of New York, as State Commissioner of Education to succeed the late Dr. Andrew S. Draper.

CURRENT PERIODICALS.

(In this section only such articles will be noticed as bear directly or indirectly upon the interests of this Journal.)

SCHOOL SCIENCE AND MATHEMATICS. Vol. XIII, No. 1, January, 1913. W. L. EIKENBERRY. *The Statistical Investigation of School Grades.* 27-36. The author calls attention to the tremendous mass of material in school grades, which only requires tabulation to throw much light upon individual mental abilities. The chief objection to the use of this material is the fact that teachers vary widely in their standards of marking, but the author believes that if grades are taken from a sufficiently large number of teachers these variations will cancel each other. Each teacher is urged to make a statistical tabulation of his own grading.

No. 2, February, 1913. W. C. BAGLEY. *Vocational Guidance and the Teacher of Science.* 89-97. The two outstanding problems in vocational guidance are (1) discovery of the specific abilities of the individual, and (2) acquainting the individual with the various occupations open to him, with the type of work they demand, the wages they pay, the preparation required, the conditions of advancement in them, and their fascinations and dangers. In order to solve these problems correctly the advocates of vocational guidance need to be cautious in their presuppositions. The correlation between interest and ability is an assumption which needs testing. Interest depends largely upon the superficial aspects of a vocation, or upon "fashion," and may have little connection with native ability. The assumption that natural abilities are highly specialized needs scrutiny. In the absence of definite knowledge it is safer to assume that native endowment supplies a nervous system which can be trained to do any one of a large number of things acceptably well.

THOS. J. MCCORMACK. *On the Psychology of Errors in Elementary Mathematics.* 121-132, 211-219. Errors arise in three ways: (1) Through imperfect formation of the concept, rule, or definition involved; (2) through imperfect embedment of the concept in the system of mental associates; (3) through a hitch in the unravelment or motor expression of the concept in appropriate physical form. The article offers an interesting application of the psychology of space to the teaching of geometry and algebra.

No. 3, March, 1913. WORRALLO WHITNEY. *Science in the High Schools, an Investigation.* 183-196. A comparative study of curricula in botany, showing the gradual evolution of the teaching of high school botany away from the servile imitation of college botany characteristic of a few years ago, to a more independent position. The present tendency is toward a flexible course, in which the purely scientific development of the subject is subordinated to the development of the pupil's interest in botany.

A. DUNCAN YOCUM. *A First Step in Inductive Research into the*

most Effective Methods of Teaching Mathematics. 197-210. A stimulating survey of the fields of geometry, algebra, and arithmetic from the point of view of problems for the experimental investigation of the teaching of these subjects. Over one hundred problems are mentioned and briefly discussed. The author makes no reference to previous work in this field.

No. 4, April, 1913. ELLIOT R. DOWNING. *A Study of an Attempt at Uniformity in Grading Students.* 290-293. An investigation showed that the twelve members of a school faculty had widely different standards of grading. The faculty passed legislation requiring that grades should approximate the probability curve. The results for four terms show a decided increase in uniformity.

No. 6, June, 1913. W. C. RUEDIGER. *Realness in Science Teaching.* 461-468. A study of the reports of sixty-five college students on their recollections of the way in which high school science was taught. Field trips, excursions and out-door work were decidedly uncommon. There was much laboratory work, but little conception by the student of its significance.

ZEITSCHRIFT FUER ANGEWANDTE PSYCHOLOGIE. Vol. VII, Nos. 2 and 3, March, 1913. RICHARD MUELLER-FREIENFELS. *Thought Types and Imagination Types.* 121-184. This analysis of mental types is based not on experimental investigations, but on a study of the histories of great men, particularly the eminent men of art and science. In this respect it resembles the work that the celebrated physical chemist Wilhelm Ostwald has done in his "Grosse Männer" and other writings. The author distinguishes two sorts of observers: (1) the "individualist," who is cognizant of only the specific object before him, and (2) the "type observer," who is aware of the individual object chiefly as a representative of a type or class. He believes that the first sort is met with more frequently among workers in the descriptive sciences (physics, chemistry, history, etc.), and the second among mathematicians and philosophers. From another point of view the static worker is distinguished from the dynamic worker (the latter is characteristic of creative art), and with reference to the self the subjective is contrasted with the objective thinker. Each of these types is illustrated with many examples drawn from history, and the attempt is made to establish certain correlations between the types.

ANATHON AALL. *The Psychology of Narrative Reproduction.* 185-210. A comparison of the fidelity of immediate reproduction of a story with reproduction after a lapse of two days. In immediate reproduction there are two types of attack, (1) the enumerative type, in which the attention is directed to a kind of catalogue of the details, and (2) the narrative, in which the individual details are subordinated, fused or modified in the interests of a well balanced story. The article presents a detailed discussion of the percentage of error in each of twenty points of the story. Later reproduction furnishes

much evidence of the effects of the first reproduction, in that errors made in the first are apt to be repeated in the later rendering. On the other hand there is a supplementary memory activity, in that points omitted in the first reproduction frequently appear in the second. The second reproductions of the men were more condensed and more sharply defined, those of the women were more detailed and gave evidence of greater tenacity. The men lost ten per cent. more than the women in two days.

MAX HENTSCHEL. *Two Experimental Investigations on Children in the Realm of Tone Psychology. Part II. Judgment of Small Intervals.* 211-222. The average of correct judgments for the prime at 800 vibrations per second was, boys, 94 per cent., girls, 90 per cent., with a total range of from 81 per cent. to 97 per cent. Children from 10 to 14 years of age gave 25 per cent. correct judgments of direction to a difference of $\pm$ 5 vibrations about 800 per second. At this difference 51.5 per cent. were judgments of equality. The percentage of correct answers at $\pm$ 10 vibrations was boys 55 per cent., girls 48 per cent.; at $\pm$ 20 vibrations, boys 72 per cent., girls 65 per cent.; and at $\pm$ 50 vibrations, boys 88 per cent., girls 84 per cent.

G. FR. MUTH. *Experiments in Ornamentation with Children from Six to Ten Years of Age. Part II. The Parallel Development of Three Children.* 223-271. The first part of this discussion appeared in Vol. VI, No. 1. The three children under consideration were provided with sheets of paper of uniform size on which concentric circles of a given diameter had been drawn. These were called plates, and the children were called upon to decorate them as beautifully as possible. Several illustrations of ornamental shields were shown them as samples, but no further instruction or directions were given. The spontaneous development of their inventiveness in ornamentation during the years mentioned is described in detail.

Nos. 4 and 5, June, 1913. G. HEYMANS AND H. J. T. W. BRUGMANS. *Intelligence Tests with Students.* 317-331. An experimental contribution to the analysis of complex intellectual activities into simpler mental processes. The authors used six tests of memory, six of imagination, six of perceptual and motor activities, three of concentration, and five of reasoning, and calculated the coefficients of correlation. The highest positive correlation was between imagination and reasoning (+ .94), while the correlations of perceptual and motor activities with other functions were largely negative and thus indicate a certain antagonism between those functions.

ADOLF KOCH. *An Experimental Investigation of the Process of Abstraction in Elementary School Children.* 332-391. The first twenty pages of this article, which is a product of Külpe's laboratory, give a detailed summary of previous work on abstraction. For the experiments nine boys were so selected from each of the eight grades that each group contained three bright, three average, and

three dull pupils. With each of these 72 pupils ten experiments, each of twenty minutes duration, were performed. The task was to find among a large number of geometrical figures the one like the figure shown on a screen, *i. e.*, to make the abstraction of likeness. The author concludes that ability in this exercise is more a function of intelligence than of age or of school acquisition.

ERNEST BLOCH AND HEDWIG LIPPA. *The Binet-Simon Tests of Intelligence* (1908) *applied to Feeble-Minded Children.* 397-409. An account of the application of the Binet tests to 71 pupils of a special school for retarded children.

ZEITSCHRIFT FUER PSYCHOLOGIE. Vol. LXIV, No. 1, February, 1913. PAULA MEYER. *On the Reproduction of Memorized Figures and their Spatial Relationship by Children and Adults.* 34-91. This investigation from the laboratory of G. E. Müller, Göttingen, contains a detailed analysis of the reproduction of simple geometrical figures. The method lends itself well to use with children as young as seven years. Children make more errors of position than adults, they tend to reduce rather than to enlarge the figures, and they show a considerable tendency to mirror drawing. Larger figures are retained better than smaller ones, unless the small ones are intensified by a colored boundary line.

PEDAGOGICAL SEMINARY. Vol. XX, No. 2, June, 1913. GOSHICHI YAMADA. *A Study of Questioning.* 129-186. A valuable survey of previous experimental work on questioning is followed by an account of the author's own experiments on 134 pupils of the seventh and eighth grades. Passages in geographies that the pupils had studied were reviewed for ten minutes, the pupils were asked to write a spontaneous report on the selection, and were then required to answer specific questions on it. In some cases the specific questions were asked before the report was called for. The results were similar to those obtained by Stern, Lipman, and others, in that the examination gave a greater range in quantity, but stood lower in quality than the free report. The influence of a preceding examination upon a succeeding report is very slight. The mental attitude of the pupils toward the two is quite different. The article concludes with interesting quotations from answers to a questionnaire on English teaching, and a pedagogical discussion of the findings of the investigation.

FRANK E. HOWARD. *Psychological Differences between Children and Adults.* 236-253. An examination of the literature of recent experimental psychology for significant points of difference between children and adults in memory, ideation, attention, suggestion and reasoning. The results show the inadequacy of our exact knowledge on any of these topics. The retentiveness of children seems slightly greater than that of adults, but in every other respect adults are superior. There is great need for norms of performance at different ages and in different types of activity.

PUBLICATIONS RECEIVED.

(Notice in this section does not preclude a more extended review.)

JOHN DOUGLAS ADAM. *Letters of a Father and Son during College Days.* New York: Fleming H. Revell, 1913. Pp. 207. $1.00 net.

This is a series of solemn reflections on the weighty problems of life expressed in epistolary form. They are rather sermonettes than letters. It is to be feared that both father and son are altogether too pious to represent the views of any real persons on actual situations.

Agricultural Instruction in Secondary Schools. Bulletin No. 522. Washington: Bureau of Education, 1913. Pp. 51.

Papers read at the third annual meeting of the American Association for the Advancement of Agricultural Education, Atlanta, November 12, 1912.

Annotated Bibliography of Medical Inspection and Health Supervision of School Children in the United States for the Years 1909-1912. Bulletin No. 524. Washington: Bureau of Education, 1913. Pp. 135.

A valuable compilation. The annotations are exceptionally ample, and present a clear idea of the essential findings.

A Trade School for Girls. A Preliminary Investigation in a Typical Manufacturing City, Worcester, Mass. Bulletin No. 525. Washington: Bureau of Education, 1913. Pp. 59.

An investigation to determine the type of school that would best meet the vocational needs of female wage earners. Conducted by the research department of the Women's Educational and Industrial Union of Boston.

FRANK P. BACHMAN. *Overage and the Method of Determining Overage.* New York: Committee on School Inquiry, 1913. Pp. 52.

A discussion of the overage conditions of New York City schools, together with a criticism of the present methods of securing and presenting overage data.

JESSIE H. BANCROFT. *The Posture of School Children.* New York: The Macmillan Company, 1913. Pp. xii, 327. $1.50 net.

This book was prepared by the assistant director of physical training of the New York City public schools with special reference to home hygiene and to new efficiency methods for school training.

"These methods are largely an application of some of the principles of the new school of efficiency engineers, or scientific management experts,—principles that are working a revolution in industrial circles, and may do equally important service in education if the way can be found for applying them." The book contains a twelve-page bibliography.

HOLMES BECKWITH. *German Industrial Education and its Lessons for the United States.* Bulletin No. 529. Washington: Bureau of Education, 1913. Pp. 154.

A valuable comparative study of conditions in Germany and America, and of the industrial training in each country. In his final chapter the author suggests some important lessons that we might learn from Germany.

Bibliography of Industrial, Vocational, and Trade Education. Bulletin No. 532. Washington: Bureau of Education, 1913. Pp. 92.

The greater number of the references are liberally annotated.

E. C. BRANSON. *The Georgia Club at the State Normal School, Athens, Georgia, for the Study of Rural Sociology.* Bulletin No. 533. Washington: Bureau of Education, 1913. Pp. 41.

An interesting method of obtaining economic, industrial, and educational surveys in rural districts.

BENJAMIN GRIFFITH BRAWLEY, A.M. *A Short History of the American Negro.* New York: The Macmillan Company, 1913. Pp. xvi, 247. $1.25 net.

The author sketches the history of the slave trade, the attitude toward the negro during the revolutionary and early national period, the development of the slavery issue, the civil war, and the attainments of negroes since the abolition of slavery. The tone of the book is optimistic.

FRANCES WILLISTON BURKS AND JESSE D. BURKS. *Health and the Schools.* New York: D. Appleton & Co., 1913. Pp. xix. $1.50 net.

Under the guise of a series of conferences between a school superintendent, a member of the school board, a self-made business man, his wife, a social worker, and a physician the authors discuss some of the current attempts to bring the health of the child to the attention of school authorities and of the general public. Part I discusses the breakdown of the school in its health program, part II demonstrates the opportunity of the school for promoting health, part III ad-

vances a program of child hygiene, and part IV is entitled "Socialized Health: A Forecast."

WILLIAM TIMOTHY CALL. *A New Method in Multiplication and Division.* Hawthorne, N. J.: C. M. Potterdon, 1913. Pp. 67. $0.50.

"The method here shown is the outcome of my efforts to simplify the process of multiplying and dividing numbers. The chief purpose in this endeavor was to indulge my own curiosity as to the possibility of doing such a thing." On the basis of five as a pivotal number the author has worked out a system of multiplying and dividing large numbers which is interesting, and which might prove economical.

LUCIEN CELLÉRIER. *Littérature criminelle.* Reprinted from the Anneé Pédagogique, 1913. Pp. 38.

A discussion of the psychological effects of trashy literature and the portrayal of criminal acts in moving pictures, and a survey of the means of protection against such influences.

S. A. COURTIS. *Better Teaching in Arithmetic.* Reprinted from the Proceedings of the Harvard Teachers' Association, 1913. Pp. 30-59.

This stimulating address is illustrative of the new type of pedagogical appeal. "If we are to have better teaching, the spirit that must permeate our whole profession—from administrative officers down to the humblest teacher in the simplest rural school—must be a new sense of the necessity for a closer study of the child, a greater desire humbly to learn Nature's laws. For only as Nurture and Nature act in unison are perfect results attained." "We say the teacher should consider the individual child, but we make no provision in time, methods, or course of study for a practical exhibition of such consideration. My thesis is that we must practice what we preach; that the teaching of children is a far more complex task than even the wisest of our leaders have realized; that we must begin over again and evolve new methods, new courses of study, new ideals of education generally, and that all must be based upon the central idea of determining and ministering adequately to individual needs."

G. V. N. DEARBORN. *Notes on School-Life Hygiene.* Reprinted from the Pedagogical Seminary, Vol. 20, June, 1913. 209-221.

The author emphasizes the need of the child for abundant sleep, outdoor air, reduction of fatigue, proper food, exercise and play, freedom from care and worry, and information regarding sexual matters.

F. B. DRESSLAR, PH.D. *School Hygiene.* New York: The Macmillan Company, 1913. Pp. xi, 369. $1.25 net.

To be reviewed.

HERMANN EBBINGHAUS. *Memory. A Contribution to Experimental Psychology.* Translated from the German by Henry A. Ruger and Clara E. Busenius. Educational Reprints, No. 3. New York: Teachers College, Columbia University, 1913. Pp. viii, 123. $1.00.

The publication of Ebbinghaus' monograph in 1885 marked the beginning of the experimental study of memory—a field which has now grown to such proportions as to exceed perhaps any other topic in the output of psychological investigations. The original has long been out of print. The work is valuable from the standpoint both of method and of results, and the translators have rendered American students a valuable service in making it accessible in its complete form.

EDWARD EGGLESTON. *The Ultimate Solution of the American Negro Problem.* Boston: R. G. Badger, 1913. Pp. 285. $1.50 net.

The author states that this is an attempt to put the negro question on a strictly scientific footing. A survey of the early history of man, of the habits of primitive man, and of the native African peoples convinces him that the negro is of an unalterable mental and moral inferiority, and is destined to be eliminated. A brief history of negro slavery leads up to an elaborate consideration of negro vital statistics, negro crime, and negro education, all of which point to the steady elimination of the negro in this country.

Expressions on Education by American Statesmen and Publicists. Bulletin No. 538. Washington: Bureau of Education, 1913. Pp. 39.

Almost all the leaders in American affairs have expressed themselves strongly in favor of education, and it will be convenient and useful to have some of these expressions collected in a single volume.

Fifteenth International Congress on Hygiene and Demography, Washington, 1912. Bulletin No. 528. Washington: Bureau of Education, 1913. Pp. 57.

Part I of this report is a description and discussion of the numerous exhibits at the congress. This was prepared by Dr. Fletcher B. Dresslar. Part II contains a digest of some of the more important papers.

KARL GROOS. *Das Seelenleben des Kindes.* Fourth edition, revised and enlarged. Berlin: Reuther & Reichard, 1913. Pp. 335. M. 4.80. Geb. M. 5.70.

The popularity of this work is attested by the rapidity with which new editions are called for. While the general tone of the work is theoretical rather than experimental, there is a noticeable tendency in the later editions to lay greater stress on the results of experimental investigations. No mention is made of the recent extensive studies in mental tests.

COSMO HAMILTON. *A Plea for the Younger Generation.* New York: Geo. H. Doran Co., 1913. Pp. 74. $0.75 net.

An impassioned protest against the usurpation by the school of those aspects of education which, according to the author, are the prerogatives and duties of the home. In particular the author condemns the godlessness of modern education, and urges a return to "the fear of God as the beginning of wisdom." The subject of sex enlightenment receives special consideration as the peculiar topic which should be left to parental instruction.

W. H. HECK. *A Second Study of Mental Fatigue in Relation to the Daily School Program.* Reprinted from the Psychological Clinic, Vol. 7, No. 2, April 15, 1913. 29-34.

A repetition in Lynchburg, Va., of an experiment recently tried by the author on pupils of the New York City schools. The conclusions of the New York investigation are confirmed by the present study, *viz.*, that the fatigue is so slight as to be almost negligible in a hygienic school environment.

A. C. HILL. *Prison Schools.* Bulletin No. 537. Washington: Bureau of Education, 1913. Pp. 47.

Every thoughtful man must admit that society's treatment of its criminals is a marvel of waste and stupidity. With all of our conservation of national resources we are only beginning to appreciate the importance of the conservation of man. The idea of revenge and enslavement for infraction of law is an instinctive and primitive attitude that still holds sway. It is only recently that the physical welfare of the condemned began to receive attention, while the idea of their mental and moral improvement still seems utopian. The present monograph gives an interesting account of the work done in the New York State prison schools, and argues for an extension of that work.

WALTER S. HUNTER, PH.D. *The Delayed Reaction in Animals and Children.* Behavior Monographs, Vol. 2, No. 1. Serial No. 6, 1913. Pp. v, 86. $1.15.

Education has already derived valuable concepts and points of view from experimental studies of animal behavior. It is noteworthy and entirely laudable that the experimentalists are beginning to attack the more complex forms of behavior, and that they are making their work comparative in the broader sense by testing children and adults under the same conditions as those under which animals are studied. The present monograph is a comparative study of the representative factor in the behavior of animals and children. Since the aim of education is to control action, and since the ideational control of action rests upon the representation of previous experience, it is obvious that such a study is vitally related to the educative process. The subjects used in the experiments were white rats, dogs, raccoons and five children from two and one-half to eight years of age. All of the subjects learned to respond correctly to the situation after the stimulus had been removed. The amount of delay was lowest for the rats and highest for the older children. The author distinguishes three types of learning: 1. Trial and error alone. Here belongs the learning of the cats and dogs. 2. Trial and error controlled to some extent by a representation of strictly sensory content, or "sensory thought." The behavior of the raccoons and of the youngest child was of this type. 3. In addition to trial and error and sensory thought the behavior of the older children showed "the possibility of directing reactions by images."

Illiteracy in the United States and an Experiment for its Elimination. Bulletin No. 530. Washington: Bureau of Education, 1913. Pp. 38.

A compilation of statistics and diagrams showing the illiteracy of the different states, and an account of an experiment in Rowan County, Ky., to teach all the people, even adults 90 years old, to read and write.

I. IOTEYKO. *Premier Congres International de Pédologie tenu a Bruxelles,* 12-18 *Aout,* 1911. *Vol. I. Comptes Rendus des Seances, Communications. Pp.* 488. *Vol. II. Rapports.* Pp. 600. Both volumes, 20 francs.

These two thick volumes give an excellent picture of the status of the new science of paidology, particularly as represented in Western Europe. Among the important discussions are a series of papers on the teaching of paidology, studies of anthropometry, scientific studies of aptitudes and capacities, reports on coeducation, psychoanalysis with children, report experiments, children's definitions, the value of manual training, etc. The reports should be accessible to every student of child nature.

F. B. JEVONS. *Personality.* New York: G. P. Putnam's Sons, 1913. Pp. vii, 172. $1.00 net.

Everyone believes in his own existence and that he knows something about himself. But when he asks himself just what he knows about his own personality, he begins to find himself in difficulty and in so far as he persists in this inquiry he becomes a philosopher. The four chapters of this book deal with personality and impersonality, psychology and personality, personality and change, and personality and individuality. Much of the book is devoted to a discussion of Bergson's views.

GEORG KERSCHENSTEINER. *A Comparison of Public Education in Germany and in the United States.* Bulletin No. 534. Washington: Bureau of Education, 1913. Pp. 15.

The author, who recently spent several months in this country studying American schools at first hand, and who is one of the foremost German school men, points out the superior thoroughness of the German secondary school, but at the same time laments the weaknesses of the German schools in technical education.

EDWIN J. KYLE AND A. CASWELL ELLIS. *Fundamentals of Farming and Farm Life.* New York: Charles Scribner's Sons, 1912. Pp. xxxii, 557.

In this day of emphasis on the teaching of agriculture in the schools it is advisable not only for teachers of agriculture but for educators in general to keep in touch with the literature of the subject. The present text contains an abundance of practical information on the scientific aspects of farming, is delightfully written, and stimulates the reader to continue his studies in more technical treatises. It is one of the most valuable books of its kind.

SIR RAY LANKESTER. *Science from an Easy Chair.* Second Series. New York: Henry Holt & Co., 1913. Pp. xiii, 412. $2.00 net.

In this country being a scientific man is usually synonymous with being dull, heavy, ponderous, incomprehensible. In England there is a tradition that the scientist should not only delve deeply into his subject, but that he should have a considerable amount of information on all sorts of things, and that he should be able to touch upon a wide range of subjects lightly, deftly, entertainingly. In this volume the eminent English zoologist has brought together a large number of papers, written with charming grace, yet permeated with the scientific attitude of mind, which he has contributed from time to time to the columns of the Daily Telegraph. The subjects range all the way from kissing and cookery, through tadpoles and fern seed, to glaciers and prehistoric animals.

HELEN MACMURCHY. *Feeble-Minded in Ontario. Seventh Report, for the Year* 1912. Toronto: L. K. Cameron, 1913. Pp. 52.

The present report chronicles a great awakening of interest in Canada in the problems of the feeble-minded. In place of the old indifference, there are discussions, mass meetings, letters to the press, and newspaper editorials calling attention to local conditions and demanding that something be done. Dr. MacMurchy's reports constitute an effective means for focussing the attention of the public upon this important social question.

FRANK M. MCMURRY. *Elementary School Standards.* Yonkers, N. Y.: The World Book Co., 1913. Pp. ix, 218.

This is the second volume of the School Efficiency Series issued under the editorship of Professor Paul H. Hanus. Like the previous volume by Professor Moore, this book had its origin in the report of the Hanus Commission to the Committee on School Inquiry of New York City. In the present volume Professor McMurry makes a constructive criticism of the quality of the teaching, the course of study, and the supervision by the principals in the New York elementary schools. He found it necessary to formulate standards of value for judging the work of the elementary schools, and a careful study of these standards will be profitable for every educator.

GEORGE FOOT MOORE. *The Literature of the Old Testament.* New York: Henry Holt & Co., 1913. Pp. vi, 251. $0.50 net.

A popular account of the old testament from the standpoint of the results of higher criticism.

MAX OFFNER. *Das Gedächtnis. Die Ergebnisse der experimentellen Psychologie und ihre Anwendung in Unterricht und Erziehung.* Third edition, enlarged and partially rewritten. Berlin: Reuther und Reichard, 1913. Pp. xii, 312. M. 20. Geb. M. 5.00.

This is unquestionably the most complete and systematic account of the phenomena of memory that is available in psychological literature. The titles of the sections are: 1. The position of memory in the whole field of mental life. 2. Sensation and idea. 3. The concept of disposition. 4. Association. 5. The strength of dispositions. 6. The awakening of dispositions and their effects (reproduction). 7. Individual and sex differences in memory. 8. The dependence of memory upon age. Capacity for improvement. The law of decay. 9. Memory and intelligence. The value of remembering and forgetting. It is remarkable that no mention is made of recent American experiments on the subject.

ELSIE CLEWS PARSONS, PH.D. *The Old-Fashioned Woman: Primitive Fancies about the Sex.* New York: G. P. Putnam's Sons, 1913. Pp. viii, 373. $1.50 net.

A curious and fragmentary, yet withal very interesting, collection of ideas, comments and customs relating to the status of woman. Customs of Bushrangers and South Africans, of Fijis and Dyaks, are brought into close juxtaposition with ideas of Pall Mall and Fifth Avenue, and all are used in half mocking fashion to show the absurdities in the traditional conception of the sphere of woman.

W. PETERS. *Die Beziehungen der Psychologie zur Medizin und die Vorbildung der Mediziner.* Würzburg: Curt Kabitzsch Verlag, 1913. Pp. 33. M. 1.20.

An argument for the inclusion of psychology as a required subject in the course of study for all medical students. Although the physician comes into more intimate relations with all sorts and conditions of mental make-up than any other professional man, medical training leaves him not only ignorant of modern scientific psychology, but oftentimes arrogant and scornful toward it. This cripples his efficiency, for the physician should treat not merely the body but the whole organism.

Proceedings of the Department of Superintendence, Philadelphia, Pa., February 24-28, 1913. National Education Association, 1913. Pp. 227. Twenty-five cents.

Among the most valuable papers reported here are the discussions of uniformity standards, by Finnegon and McMurry; Developing the co-operation and initiative of teachers, by Judd; School credit for outside work, by Meek and Alderman; Reports on economy of time, by Wilson, Judd, Coffman and Ayres; Scientific management, by Hanus, Spaulding and Yocum; and Efficiency of teachers, by Davidson and Blewett.

E. E. RALL. *An Experiment with the Courtis Tests in Arithmetic.* Reprinted from School Review Monographs, February 1913. 36-44.

An effort was made to determine by means of the Courtis Tests the improvement in reasoning ability resulting from special attention to "problem" work with fifth-grade pupils for one-half school year, and the possibility of correcting deficiencies so that individual records would be brought up to the "standard" scores. The practiced group showed a far greater gain than the unpracticed group, but the individual records showed an increase rather than a decrease in lack of uniformity.

Report of the Commissioner of Education for the Year Ended June 30, 1912. 2 Vols. Washington: Bureau of Education, 1913. Pp. xxvi, 647 and xviii, 669.

The present report fully maintains the reputation of the department for valuable compilations of statistics, and constructive surveys of current educational movements. Of especial interest are the resumes of current criticisms of the public schools, the activities in city school systems, the progress in vocational education, and the description of typical health teaching agencies.

C. H. Robison and F. B. Jenks. *Agricultural Instruction in High Schools.* Bulletin No. 513. Washington: Bureau of Education, 1913. Pp. 80.

Interesting topics in this bulletin are the provisions for the higher training of teachers of agriculture, relations of secondary to elementary agriculture, and the difficulties of instruction in the subject.

Leroy Walter Sackett, Ph.D. *The Canada Porcupine: A Study of the Learning Process.* Vol. 2, No. 2, Serial No. 7, 1913. Pp. iii, 84. $1.15.

The first fifteen pages of this monograph are devoted to a biological and naturalistic study of the animal under investigation. The experimental section describes reactions to puzzle-box situations, color and brightness discrimination, and learning the Hampton Court Maze. The animals readily learn to manipulate a puzzle-box with four locks in series, show moderate ability in brightness discrimination, but no color discrimination, and learn to run the maze very quickly. Their retention is remarkably good where kinaesthetic factors are involved.

E. Mather Sill, M.D. *The Child, its Care, Diet, and Common Ills.* New York: Henry Holt and Co., 1913. Pp. viii, 207. $1.00 net.

A series of simple, sensible talks on the feeding of infants and particularly on the treatment of the common diseases of childhood. It is a scientific work, yet plain enough to be comprehended by all. It constitutes a good supplement to Holt's Care and Feeding of Children.

Gerald Birney Smith. *Social Idealism and the Changing Theology.* New York: The Macmillan Co., 1913. Pp. xxii, 251. $1.25 net.

It is interesting to note that the professor of theology in one of our leading divinity schools admits that there is need for a reconstruction of Christian theology in our day. On the basis of "Social Idealism" he attempts to indicate the lines of this reconstruction.

It is safe to assume, however, that the author's position is not sufficiently radical to satisfy the vast majority of scientific thinkers, who are desirous of a religion to which they can give full assent without stultifying their own conceptions of truth.

ALVA WALKER STAMPER, PH.D. *A Text Book on the Teaching of Arithmetic.* New York: The American Book Co., 1913. Pp. 296. $1.00.

"In planning the present book, the author has kept in mind three aspects of the teacher's preparation: the need of the perspective gained through a comprehension of the larger teaching problems concerned in the teaching of arithmetic, the need of a clear insight into the content of arithmetic, and the need of an understanding of arithmetic method."

Types of Schools for Young Children. London: The Froebel Society, 1913. Pp. 16. 2d.

This little pamphlet contains two addresses, one by Miss Esther E. Lawrence on *Free Kindergartens,* in which she institutes a comparison between the Montessori work in Rome and the work done by the free kindergartens in London, and the second by Miss Rose Solomon on *An Infant School,* in which a detailed comparison of the Montessori course of study is made with that of the Jews' Infant School, Whitechapel.

J. E. W. WALLIN. *Clinical Psychology: What it is and what it is not.* Reprinted from Science, June 13, 1913. 895-902.

The author is at pains to distinguish clinical psychology from psychopathology, from neurology, from general medicine, from pediatrics, and from introspective, educational, or experimental psychology, and insists that "the assumption that any psychologist or educationist is qualified to do successful psycho-clinical work after learning how to administer a few mental tests, is preposterous and fraught with the gravest consequences."

R. S. WOODWORTH. *The Care of the Body.* New York: The Macmillan Company, 1912. Pp. viii, 359. $1.50 net.

A book on personal hygiene, "intended chiefly for the young man" and "founded on the belief that an intelligent man, without technical knowledge of medicine, and without excessive attention to the care of his health, can still do much to keep himself in good condition." Its chapters deal with the chief physiological functions, circulation, respiration, digestion, elimination, etc., and with important hygienic problems like work, rest, recreation, indulgences, diet, etc. The pages devoted to alcohol and tobacco furnish a sane and straightforward presentation that writers of temperance physiologies would do well to imitate.